UILD A GAS-POWERED CAMERA PLANE

MODEL AIRPLANE NEWS

MAY 1938
20¢

The Curtiss XP-37
(See Page 10)

THE WINNER! *made from a* "BURD" *kit of Dick Korda's* WORLD RECORD HOLDER!

YOU HEAR THE SAME STORY AT ALL CONTESTS NOWADAYS!

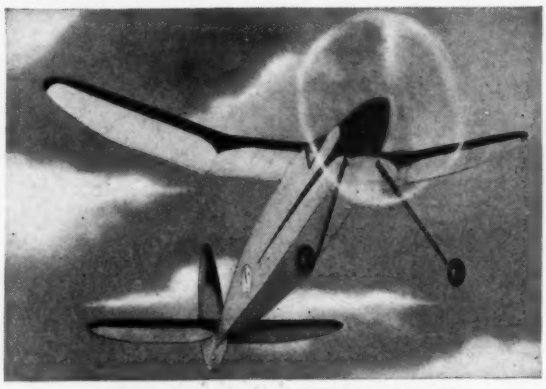
SIMPLE AS ABC TO BUILD!

THE many thousands of sets we have sold are having their effect on contests throughout the world! At every meet it's the same story! *The winner* was made from a "BURD" kit of *Korda's "World Record Holder"!* It's not unexpected either. It's merely the telling effect of proper design, combined with simple construction, with the result that it's a prize winner every time. Look what the original model has already done in international competition against the world's best model experts.

- ★ First place winner flying 54 minutes in the outdoor open cabin event at Detroit Nationals.
- ★ Eighteen minutes in Moffett elimination.
- ★ Third place in the stiff Wakefield competition.

You can see for yourself it's a **proven** prize winner. It's the simplest model to build that you have ever seen so beginners need not fear its construction. If you want to be in a class with the champions in your city get one of these AT YOUR DEALER'S NOW (see below) or write in direct AT ONCE if there is none near to serve you.

Every dealer who carries a line of model products should have this set on his shelves. Ask him for it. If he DOESN'T HAVE IT, call it to his attention and request him to get it for you AT ONCE.



KORDA'S 43" WORLD RECORD HOLDER

A TERRIFIC VALUE!!
43" WINGSPAN
38" LENGTH

ONLY $1.00

COMPLETE POSTPAID OR AT YOUR DEALER'S

RECOMMENDATIONS

M & M air wheels...pr., 50c
Shaped prop blanks (saw cut furnished but you may prefer to carve your own) .....each, 30c
Bundle of 80 ft. Special Brown Contest Rubber..40c
(This model performs best on a good grade of FRESH rubber. To insure freshness sets are packed without rubber.)

FREE!

WITH ALL MOTORS BELOW

1 FINISHED PROP
1 BURGESS BATTERY
1 BOTTLE SAE 70 OIL

SOLD SEPARATELY

Prop.	$1.00
Burgess Battery	.80
SAE 70 Oil	.20
Champion Plugs	.65
Hurleman Plugs	.75
"Goliath" Coil	2.50

SYNCRO-ACE
$15.00

Immediate delivery guaranteed!

free prop & oil with kits

WARRIOR	$12.00		
MIGHTY MIDGET (upright)	14.00	KIT	$ 9.85
MIGHTY MARINE	17.75	KIT	11.40
MIGHTY MIDGET (inverted)	17.25	KIT	10.10
GWIN AERO (Upright)	17.50	KIT	11.35
GWIN AERO (inverted)	18.25	KIT	11.60

Free prop, oil, and necessary batteries with small motors

CONDOR MIDGET $18.50
BRAT $16.50
TROJAN $18.50

DEALERS: GET OUR MONEY MAKING PROPOSITION

BURD

MODEL AIRPLANE COMPANY

101-105 West Pratt Street Baltimore, Md.

IN ENGLAND: Elite Model Planes, 14 Bury New Rd., Manchester
IN SWEDEN: Sven Wentzel, Apelbergsgaten 54, Stockholm
IN SOUTH AFRICA: Model Aircraft, Ltd., 23 Dock Rd., Capetown
IN AUSTRALIA: K Dee Mnfg., Ltd., 113b Bathurst, Sydney

5 FOOT FLYING MODELS $1.50 Post-Paid

With finished BALSA PROPS & BROWN CONTEST RUBBER

There's tremendous value packed in every one of these giant sets. Think of having a plane take off, land, and look exactly like a real one. It sure is a thrill. These sets are simple to build and they are really complete—full size plans, shaped balsa props, generous quantities of glue and dope, BROWN CONTEST RUBBER, colored tissue, balloon type hardwood wheels, and many other parts and features that make this set an outstanding value. Get one of these NOW and get the thrill of big ship flying.

BIG WINGSPANS

5 FT. REARWIN SPEEDSTER

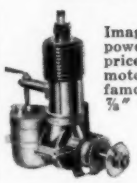
5 FT. CURTISS ROBIN $1.50

5 FT. FAIRCHILD '24'

NOW THE PERFECTION OF A BROWN MOTOR FOR ONLY $10.00

immediate delivery guaranteed!

MODEL D

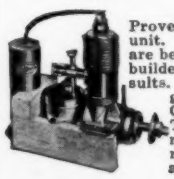


Imagine getting one of these power plants at this amazing price! This new, low price motor has everything that the famous models B and C have. ⅞" bore, 1" stroke, 1/5 h.p. Every single motor is tested and doubly guaranteed. Immediate shipment guaranteed.
Only $10.00

MODEL M

A specially designed Marine Motor that will certainly make your boat hum. It's a big value at this price. ⅞" bore, 1" stroke, 1/5 h.p. every motor tested and doubly guaranteed. Immediate shipment guaranteed.
Only $15.00

MODEL CV



Proven a dependable power unit. Thousands of these are being used by gas model builders with splendid results. For a really de-luxe gas motor this model CV is tops. Get yours TO-DAY and you will never regret it. Immediate delivery guaranteed.
Only $17.0

MODEL B

This Model B is the motor that began gas model building. It was then the finest power unit available, and with its many improvements through the years, still remains the most popular, powerful, gas model unit available. Get one for lasting satisfaction. Immediate delivery guaranteed.
Only $21.50

BROWN SPARK PLUGS	$1.0
EXHAUST MANIFOLD	1.0
BROWN FUEL TANK	1.5

CHAMPION OF ENGLAND!
CHAMPION OF GERMANY!
CHAMPION OF THE UNITED STATES!
ONLY ENGINE TO WIN BOTH OPEN AND SENIOR CLASSES
CHAMPION OF FRANCE!
CHAMPION OF THE WORLD!

NO OTHER ENGINE can make this claim!

DON'T EXPERIMENT – BUY BABY CYCLONE – THE BEST IN THE WORLD

The strongest competition in the world has definitely established the Baby Cyclone as undisputed World's Champion. In 1937 it won the championship of the United States, France, Germany and England.

A BETTER ENGINE FOR LESS MONEY . . . HERE'S HOW WE SAVE YOU MONEY: The very finest materials, high precision skilled workmanship and rigid test inspection required in its manufacture make the Baby Cyclone very expensive to build. To add usual dealer's discount to cost of manufacture would cause this engine to sell for $25.00. Instead Aircraft Industries now sells only direct from factory to user thus passing the dealer's discount on to you as a big saving. You thus can buy the best and most expensive engine at the cheapest price. It has proven that it can win for others and it can win for you. Win meets! Be a Champion! Order your Baby Cyclone today . . . right now.

EVERY ENGINE IS BLOCK TESTED AND GIVEN FULL THROTTLE RUN BY THE FACTORY EXPERTS BEFORE SHIPMENT TO INSURE PERFECTION

"CYCLONE SERVICE" ⟶ Your engine positively will be shipped same day order is received

PRICE IN ALL FOREIGN COUNTRIES EXCEPT CANADA $25.00

MAIL HANDY ORDER BLANK

AIRCRAFT INDUSTRIES GRAND CENTRAL AIR TERMINAL, GLENDALE, (LOS ANGELES) CALIF.
ATTENTION C. C. MOSELEY, President
Sir: Please send me postpaid the following items checked. I enclose POST OFFICE MONEY ORDER.

◯ BABY CYCLONE ENGINE MODEL "E" . . $12.50

◯ California "Champ" Kit, Complete. $10.00 (Kit weighs three pounds, wing span five feet)
◯ California "Chief" Kit, Complete. $7.90 (Kit weighs three pounds, wing span five feet)
◯ Hardwood Propeller $1.50
◯ COMBINATION "Champ" Kit, propeller and engine. $17.85
◯ COMBINATION "Chief" Kit, propeller and engine. $15.75

SHIP TO _____ Age ___ ADDRESS _____ N-5

9th YEAR OF PUBLICATION

VOL. XVIII *No. 5*

Edited by Charles Hampson Grant

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$50 CASH

FOR NAMING THE NEW AND SMALLER

OHLSSON MINIATURE MOTOR!

Ohlsson will soon introduce a new miniature motor—a small companion to the famous Ohlsson Gold Seal Miniature. It will be about one-half the size of the present motor, and will be built to the same rigid specifications. It is designed especially for flying small models.

We need a name for this motor, and for the four best names the following prizes will be given:

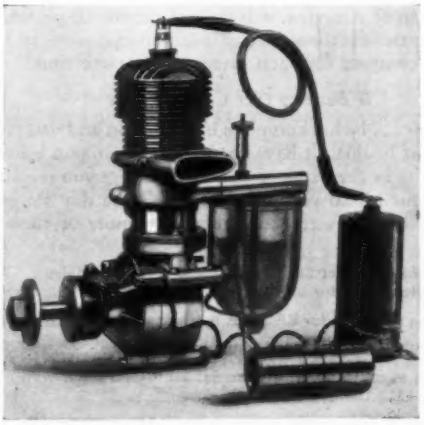
First Prize: $50 cash.

Second Prize: A new Ohlsson Miniature Motor.

Third Prize: An Ohlsson Gold Seal Motor.

Fourth Prize: An Ohlsson Pacemaker Kit.

You may send in two names. Just fill in the coupon below with your first and second choice, and mail it right away. No obligation—nothing to buy—nothing to sell. All entries must be postmarked not later than June 1.



Shown above is the famous Pacemaker California *Champion.* Complete kit for building this sensational ship is being offered as one of the prizes in the Ohlsson contest. It regularly sells for..... **$10.00**

At left is shown the popular Ohlsson Gold Seal Miniature Motor, which is also being offered as a prize. First choice of model fans everywhere, this pre-tested and guaranteed motor sells regularly for..... **$18.50**

COMBINATION OFFER

Ohlsson Gold Seal Motor, complete with new transparent fuel tank, and the Pacemaker Kit, ready for complete assembly..... **$25.00**

MAIL THIS COUPON TODAY —OR GET ENTRY BLANK FROM YOUR DEALER OR

OHLSSON MINIATURES
630 No. Alvarado Street
Los Angeles, Calif.

ONLY ONE ENTRY MAY BE SUBMITTED

(OHLSSON) MINIATURES 630 NORTH ALVARADO STREET LOS ANGELES, CALIFORNIA

Here are my two names for your new Ohlsson Miniature Motor:

First Choice .....

Second Choice.....

NAME .....

ADDRESS .....

CITY .....

It is understood that if one of my names is accepted it becomes the property of Ohlsson Miniatures. Ohlsson Miniatures will be sole judges of the names, and no entries will be returned. Employees, or relatives of employees of Ohlsson Miniatures are not eligible to participate in this contest. Entries must be postmarked not later than June 1. In the event that duplicate names are submitted, earliest postmark will determine the winner.

AN EXTRA 30 DAYS! —TO WIN $1500 IN PRIZES FOR NEW MODEL IDEAS!

Reginald Denny wants every model builder in the country to have a fair chance in this big $1500 Denny Contest...So we're extending it another 30 days...until June 1st. This gives everyone time to cash in on lucky discoveries...new ideas in model building. Now... even though you haven't started ...you have as much chance to win as anyone. *But start now!*

Get double fun from plane building this spring! You'll be making flying models anyway—build Dennys and take a chance for these big prizes. You'll have more fun and better flying with kits as fine in design and quality as these. Get acquainted now! . . . a lucky discovery may bring you one or more of the four $150.00 first prizes. We're constantly in search of new improvements, and willing to pay you for your ideas.

Anyone Can Win

Everyone is eligible to compete (except Denny employees). Any plane built before June first may be entered. Whether you've previously built one or a hundred models, you have an equal chance. *It's new ideas we want*—any kind of improvement may win. Entries will be judged simply on improved performance, or improved appearance, or a clever construction feature, or a combination of all.

Simple Rules

There's no entry fee. You don't have to buy anything. You can use any of the 4 standard Denny kits or else use your own materials—just so they're identical in size and quality with a Denny kit. The only requirement for competition is that each entry have some change or improvement over the original kit. Your entry blank (which must be enclosed carefully with each plane you send) is the large word DENNY, printed in script on all tubes and box *tops* (labels from the sides of boxes cannot be accepted) —or you may use a reasonable facsimile thereof. Simply cut this section out of the package and print your name, address, city, *and the name of your dealer* on the back. (Read rules and regulations in box at right carefully.)

One Hundred and Twenty-Four Prizes

Equal prizes are offered for each class of plane—the Denny Starling, Skylark, Condor, and Bullet. You can enter in any or all of these classes. In addition to the 24 prizes for usable improvements, one hundred $1.00 Condor kits will be given for entries that are particularly unique or carefully made.

Entries Close May First

Prizes will be announced and paid by June 30th, 1938—so all entries *must* be shipped by June first. Each plane must be completely assembled except that the wing may be detached. Shipping is easy and inexpensive—if you're in doubt about how to pack, ask your dealer or write for easy illustrated shipping plan.

Famous Pilots and Designers are Judges

Lawrence W. Brown, plane designer; Charles H. Grant, Editor of Model Airplane News; Paul Mantz, Pilot and Technician are among those who will judge your entries, their decision will be final. Qualified model builders and flyers, and members of the Junior Birdmen of America, will fly and exhibit all planes. Never before has a manufacturer offered such an opportunity to have real fun and compete for such prizes at the same time!

Where to Get Contest Kits

See your dealer . . . he has complete information and deserves your support! But if he doesn't have them, use the coupon below. And be sure to write in the name of the dealer where you tried to buy. We'll send your kit to you by return mail the day we get your order, so you can start right in for one or more of these prizes.

4 First-Prizes of $150; 1 for EACH of the four Denny models: Starling, Skylark, Condor and Bullet.....total $600

4 Second-Prizes of $50; 1 for EACH of the four models.....total $200

4 Third-Prizes of $30; 1 for EACH of the four models.....total $120

4 Fourth-Prizes of a Denny Jr. gas model kit, COMPLETE with ready-to-run 1938 Dennymite motor.....total $104

4 Fifth-Prizes of a Dennymite motor; 1 for EACH of the four models .....total $56

4 Sixth-Prizes of a Denny Jr. gas kit; 1 for EACH of the four models. (Certified N. A. A. flight, 1 hr. 47 min., 6-10 sec.).....total $38

100 Additional Prizes of a Condor Kit; 25 for EACH of the four models .....total $100

(And prizes to dealers who sell Kits to winners; $1502 in all.)

IF NECESSARY ORDER BY MAIL

Reginald Denny Industries
5751 Hollywood Blvd.
Hollywood, California

Enclosed find cash (at my own risk) or money order for the prepaid price of model checked below for which send me Denny kit by return mail.

☐ Starling 25c ☐ Skylark 50c ☐ Condor $1 ☐ Bullet $1.25

Name_____

Address_____ City_____

Dealer's Name_____

Address_____ City_____

(California customers [only], please include 3% California Sales Tax.)

...there's Still Time to Win Big Prizes on Ideas and Discoveries!

EACH DENNY KIT IS A CHAMPION IN ITS CLASS!

Kit 25c COMPLETE

Denny STARLING

Identical in style and quality with the larger models. Designed for greatest simplicity in assembling. A splendid flyer with a record of 2 minutes and 20 seconds. Wingspan 18 inches.

Kit $1.00 COMPLETE

Denny CONDOR

Tests everywhere show amazing climb and phenomenal glide—it will outperform all standard models in its class. Kit contains extra wood, cement and dope. Wingspan 32 inches.

Kit 50c COMPLETE

Denny SKYLARK

Experienced model-flyers buy Skylarks again and again—we know no better proof of fine quality and performance. Compare this with anything near the price! Wingspan 24 inches.

Kit $1.25 COMPLETE

Denny BULLET

Crack-proof! A fast climber that will hit 40 m.p.h. and glide like the finest endurance models. Ultra streamlined, low wings, adjustable rudder and stabilizer! Wingspan 25 inches.

A model is only as good as the materials you put in it. Denny kits give you the finest materials obtainable. Good hard balsa wood, generous bottles of Berryloid dope and cement. Paper—the best we can buy. A 10% over-supply of material in every kit. Experts praise our plans and instructions. All kits are precision inspected before leaving assembly line.

The big Denny prize contest offers you spectacular prizes for new ideas in your favorite hobby. You'll be building models this spring anyway, so concentrate on Denny kits for more fun, more excitement, and prizes! Simply "build in" an improvement to one of these famous flyers. Read complete details at left for easy rules and big prizes.

RULES AND REGULATIONS
Reginald Denny Contest for Improved Models

This contest is sponsored by Reginald Denny Industries solely to seek improvements in rubber-powered flying plane models, believing that improvements can best come from the men and boys who actually assemble and fly these planes. Every effort has been made to make the event easy and entertaining for everyone. The following simple rules must be observed.

1. Anyone can enter, except Denny employees.
2. All entries must bear express or postal date not later than June 1, 1938. Prizes will be announced and paid on June 30, 1938.
3. 148 prizes are offered, 124 for contestants and 24 for dealers from whom materials are purchased. Total value of prizes $1502.00—*see complete list at left.*
4. Prize awards are divided into 4 equal groups—Starling, Skylark, Condor, and Bullet models. Contestants may enter in any or all classes and are eligible for one prize in each class.
5. There is no entry fee and it is not necessary to buy anything. Entrants may use any of the 4 standard Denny kits named above, or they may use their own materials provided they are identical in size and quality with said kits.
6. Entries will be accepted only if they contain some change or improvement from the original design. However, they must remain the same general type as the class entered and must not borrow changes from other manufacturers' models.
7. Each entry must be accompanied by the large word, DENNY, printed in script on all tubes and box *tops* (labels from the sides of boxes cannot be accepted)—or you may use a reasonable facsimile thereof. Simply cut this word from the package, write your name, address, and the name of the dealer from whom you bought your materials on the back. This card is your entry blank and must be securely fastened to your entry, inside the shipping box.
8. Entries must be sent prepaid to Reginald Denny Industries, 5751 Hollywood Boulevard, Los Angeles, California. We can not accept any responsibility for injury in transit. The act of mailing such entry automatically assigns all right and title in it, and full title to its design, to Reginald Denny Industries. Payment of a prize for a winning entry is full consideration for title to said design. No entries will be returned—after the contest they will be given to orphanages and hospitals.
9. Entries will be accepted only if completely assembled, except that wings may be detached for greater ease in shipping.
10. Entries in each class will be judged and prizes awarded for the best improvement in performance, appearance, construction features, or a combination of all. The decisions of the judges will be final.

Reginald Denny Industries

5751 Hollywood Blvd., Hollywood, California

DEALERS!

A lot more profit for you. That's what an extra month in this big selling event means. Sales response and repeat orders for Denny kits all over the country have been so terrific that we predict April and May will be the biggest selling months in your history...if you act now. You get store displays, window displays, admats, information folders, publicity, national advertising support, every selling aid we know of *all free*. And extra discounts, too! Air mail your order today...or rush coupon for full details.

DEALERS! AIRMAIL NOW!

Reginald Denny Industries
5751 Hollywood Boulevard
Hollywood, California

Rush me complete details of your plan for more dealer's profits.

Name_____

Address_____

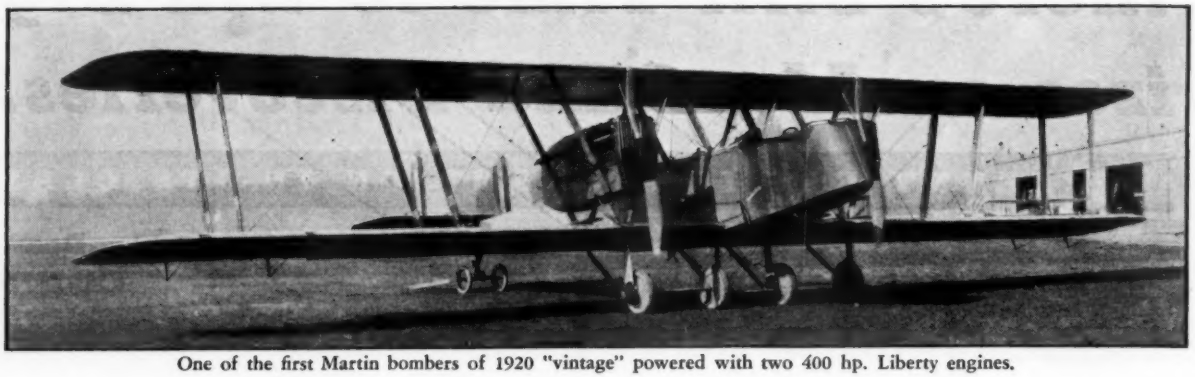
City_____ State_____

Also send me the following kits less regular dealer discounts and special profit-allowance for contest. Include all sales-help materials.

_____ Denny Starlings _____ Denny Skylarks

_____ Denny Condors _____ Denny Bullets

If you have not already an account with us, be sure to send check, money order, credit references or else state you prefer shipment



One of the first Martin bombers of 1920 "vintage" powered with two 400 hp. Liberty engines.

The Earth As a Target

How the Bombers of the U.S. Army Have Developed Step by Step from the Kite Type to the Modern High Speed Flying Fortress

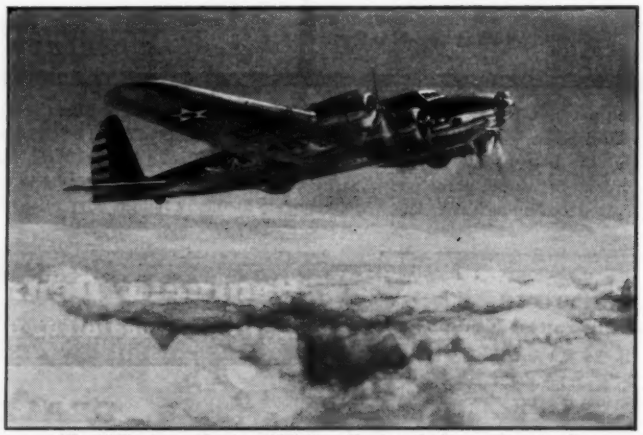
By DOUGLAS J. INGELLS

THE most feared weapons of the World War were the giant German "Gothas" —bombing planes which flew almost nightly over Paris and London dropping high explosives on the two cities and causing great destruction and loss of life. These planes taught the importance of the bomber as an offensive weapon.

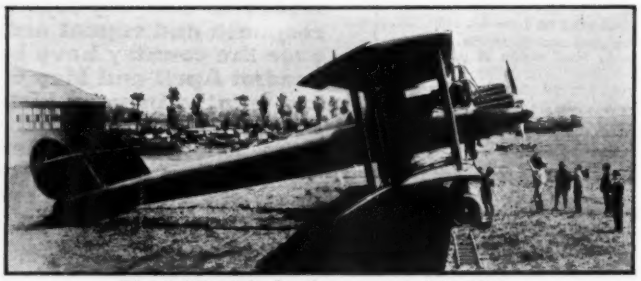
Although its own cities were not menaced by the air raids the United States has taken heed of the lessons so forcefully taught her allies. No effort has been wasted in the experimentation and the advancement of the bombing plane, so that today America has one of the most efficient "offensive" air forces in the world.

From the early slow-moving, twin-engined, Martin bomber of 1919-20 to the present day high speed, multi-engined Boeing "Flying Fortress," represents an important era in military flying. The bomber has played a leading role in the advance of progress during this period.

The importance of the bombing plane may be seen in its effectiveness. Strategic points such as military camps, ammunition depots and industrial centers can be destroyed by planes flying deep into hostile territory and dropping bombs. Battleships and even complete naval squadrons may be sent to the bottom of the ocean by bombers which can fly far out to sea.



The U.S. Army Boeing "Flying Fortress" above the clouds.



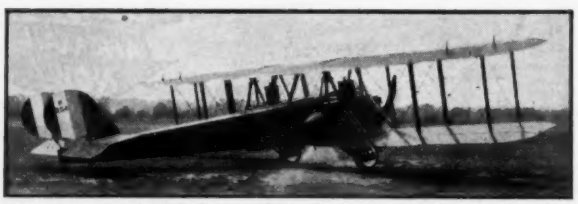
The L.S.F. night bomber, a marvel in 1921.

Recently in the Chinese-Japanese conflict a giant bomb weighing almost three tons was dropped on a Shanghai department store killing hundreds of persons and causing havoc in the business district of that city. This was only one bomb; thousands of smaller ones were dropped on the Chinese city during the Nippon air raids and ultimately Shanghai was a mass of flames and smoke. The bomber played a devastating role in this destruction.

Thus the modern bombardment plane with its long distance cruising range and high speeds has created the necessity for a drastic change in the set rules of warfare.

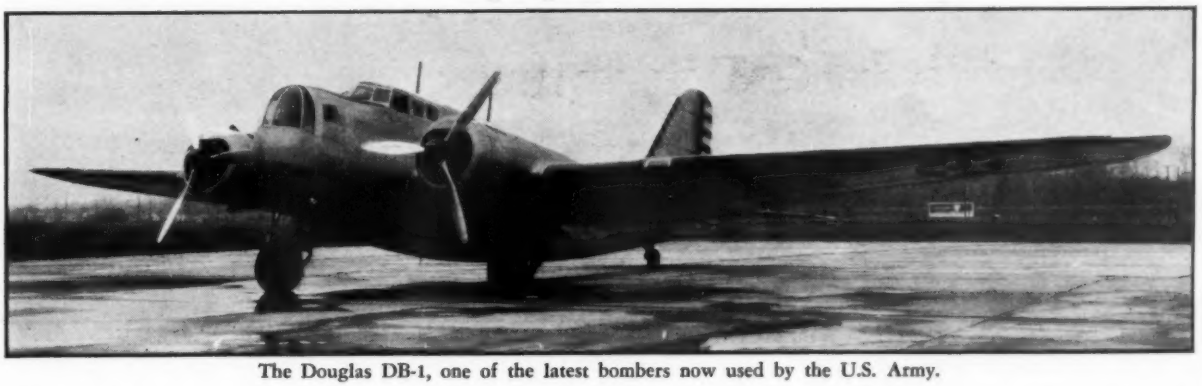
Nations which heretofore were dependent upon ground and sea forces for their national defense have awakened to the realization that the airplane makes both of these fighting units practically worthless without its aid.

In most cases these countries have created air forces which act as their first line of defense. Since the war



An early Curtiss bomber with intricate strut design. Note the box-like fuselage and the radiators above the engines.

A later Curtiss bomber with improved fuselage design and fewer struts to cause resistance.



The Douglas DB-1, one of the latest bombers now used by the U.S. Army.

America's air force has grown from a handful of men who fought over foreign soil in foreign built machines, into a well organized group having the most efficient equipment in the world.

The tactical squadrons of the United States Army Air Corps are divided into four types: the pursuit squadron, the observation squadron, the attack squadron and the bombardment squadron. Of these four the bombardment squadron is probably the most important from an offensive and defensive standpoint. This is emphasized by the fact that during the war air raids were the central factors of the great offensive drives. Bombing planes continuously threatened strategic points of both the Allies and the Germans, while the other divisions of the flying units were devoted to the protection of these bombers.

Bombing itself is not any child's play. Many years of experimentation and research have been spent in the development of new devices to eliminate the inaccuracies experienced in the days of the World War. At that time it was just a matter of flying over an objective and hurling explosive missiles upon it. Oftentimes the objective was never "touched" during the raid. But today, technical research and new inventions have made bombing a scientific operation.

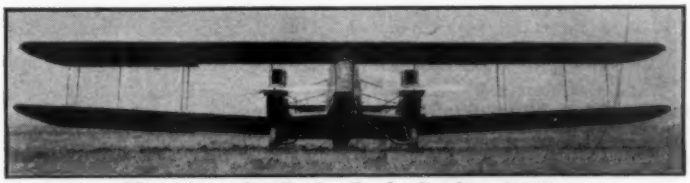
At training schools men are taught to know almost the exact spot where their explosives will land. Range finding instruments have been developed which make "direct hits" almost a certainty. Tabulations, prepared by meteorologists, determine the amount of wind resistance which the bomb, falling through space, will encounter. Thus the deviation caused by the amospherical reactions is known before the bomb actually leaves its rack.

Such developments as these make bombing the greatest of modern offensive weapons. But the real progress may be seen in the bombers themselves. They are no longer slow-moving planes, but rather giant flying fortresses capable of keeping pace with the best of their attackers and defenders—the pursuit planes.

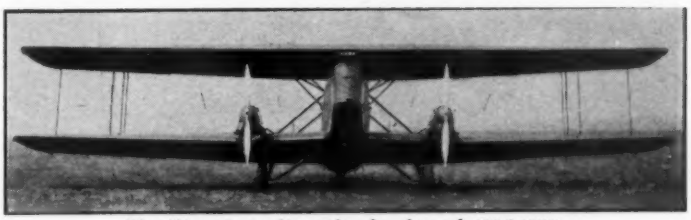
To trace the development of the bombardment plane in America is almost like telling the story of the Army Air Corps for some of the first military planes were bombers. Exclusive of the early Wright planes which were devoted chiefly to general purpose flying prior to the war, and not including the wartime DeHavillands, probably the first of the American bombers was the Curtiss R-8 biplane.

This ship was modeled along the lines of the Curtiss "Jenny" so famous for its use as a training ship at that time. Almost identical to the "Jenny" in design, with wing tip landing guards and all, the Curtiss R-8 would offer a queer contrast to the high speed streamlined bombers of modern times. But regardless of its queerness and antiquity the R-8 stands as one of the first American bombers.

Shortly after the introduction of the Curtiss R-8 which, however, was never purchased by the Air Corps, came the Glenn L. Martin twin-



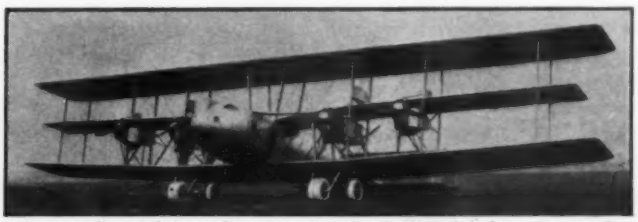
The twin engine Curtiss Condor bomber. (1925)



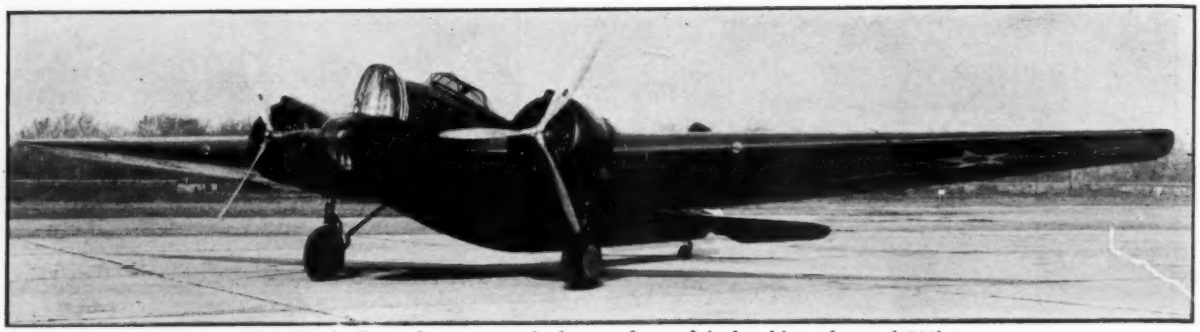
The Keystone twin engine bomber of 1926-1927.

The Keystone "Panther," first to use radial type engines. The ones installed here are Wright Whirlwinds.

The Bellanca bomber, a distinct type that saw action in South America but not in the U.S. Army.



The world's mightiest plane in 1922, the Barling bomber. It was destroyed by fire shortly after its completion.



The Martin B-10, the greatest single step forward in bombing planes. (1933)

engined bombers. These ships were giants in their day. They were known as the "Martin Twins," a name given them because they were powered with twin 400 horsepower Liberty motors. Capable of attaining an altitude of seventeen thousand feet and of carrying a crew of five—two machine-gunners, a bomber, pilot and co-pilot—they made a good bid for U. S. supremacy in the air. Three machine-gun turrets gave them sufficient protection against any attacking airplanes. Their capacity load allowed for some 1500 lbs. of bombs and 1000 rounds of ammunition.

Another one of the early bombers was the L.W.F. night bomber, a triple tractor biplane. It was one of the largest of its period, having a wing span of 106 feet. It was only capable of attaining an altitude of 6,000 feet, however, which made it an extremely easy target for attack by defending aircraft. But to offset its low ceiling it was one of the fastest planes then manufactured with a speed of 110 miles per hour.

Following the L.W.F. came the Curtiss and Aeromarine NBs-1 bombers and the Barling NBL-1 triplane. The Curtiss plane was much smaller than most of its predecessors, but had a cruising range of 2,200 miles which made it exceedingly valuable for long-distance bombing expeditions would such occasions arise.

The Barling NBL-1 which was introduced in 1922, was one of the largest airplanes of its day to fly. It was a multi-engined plane powered by six 400 horsepower Liberty motors—four of the tractor type and two of the pusher type. In addition to this feature it was also one of the few triplanes ever used in the U. S. Army Air Corps. It was capable of an approximate speed of 96 miles per hour with its full load which consisted of a crew of four and a bomb load of 5,000 lbs.

Although it was built for the Army it saw very little practical use. During its long period of construction progress had reached past it and it was out of date by the time it was completed.

One of the pilots who test flighted the giant made the remark, "She rides so smoothly one could leave the controls and go back in the cabin and play bridge," which proved that there was nothing inferior about the Barling's flying qualities.

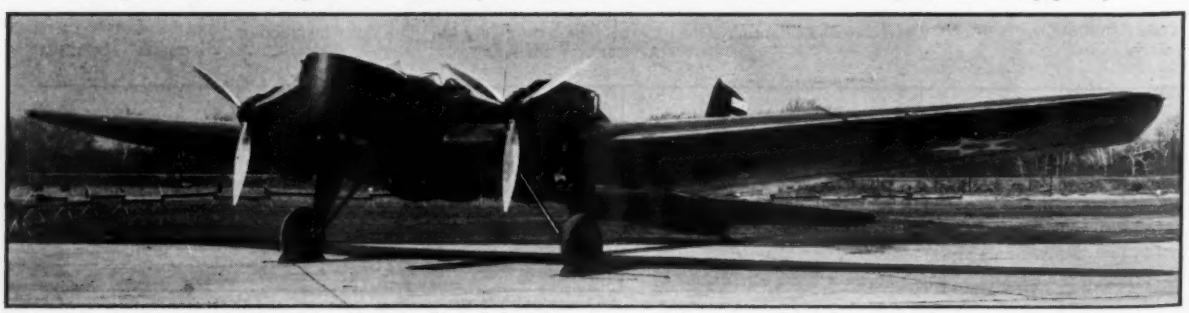
These planes and improvements upon them covered a period of about five years from 1919 to 1924. There followed a new era in aviation which might be called the "progressive age" for it led to the development of many new and almost undreamed of types of airplane, inclusive of the bomber, which probably saw improvements that no other craft could boast of.

The latest and largest bomber of the U.S. Army; the mammoth Boeing B-15 in flight over Seattle on a test hop.

During this era there came into being the Curtiss "Condor" and the Keystone "Pegasus." Probably the most important of these two ships was the "Pegasus" for it was one of the fastest of the bombers, being able to travel at a speed of 125 miles per hour. It was a light bomber powered with a Packard engine and it carried only one man, who did both the bombing and the piloting.

Directly following the introduction of the "Pegasus" the Keystone Company which is no longer in existence, produced three new bombers, the "Super Cyclops," the "Pirate" and the "Panther." The "Cyclops" was the only one of the three to be driven with a single power unit, the other two being twin-engined planes. Most famous of the trio was the "Pirate" for at that time its fuselage was regarded to be the "ideal type" by Army engineers and experts. The location of

(Continued on page 46)

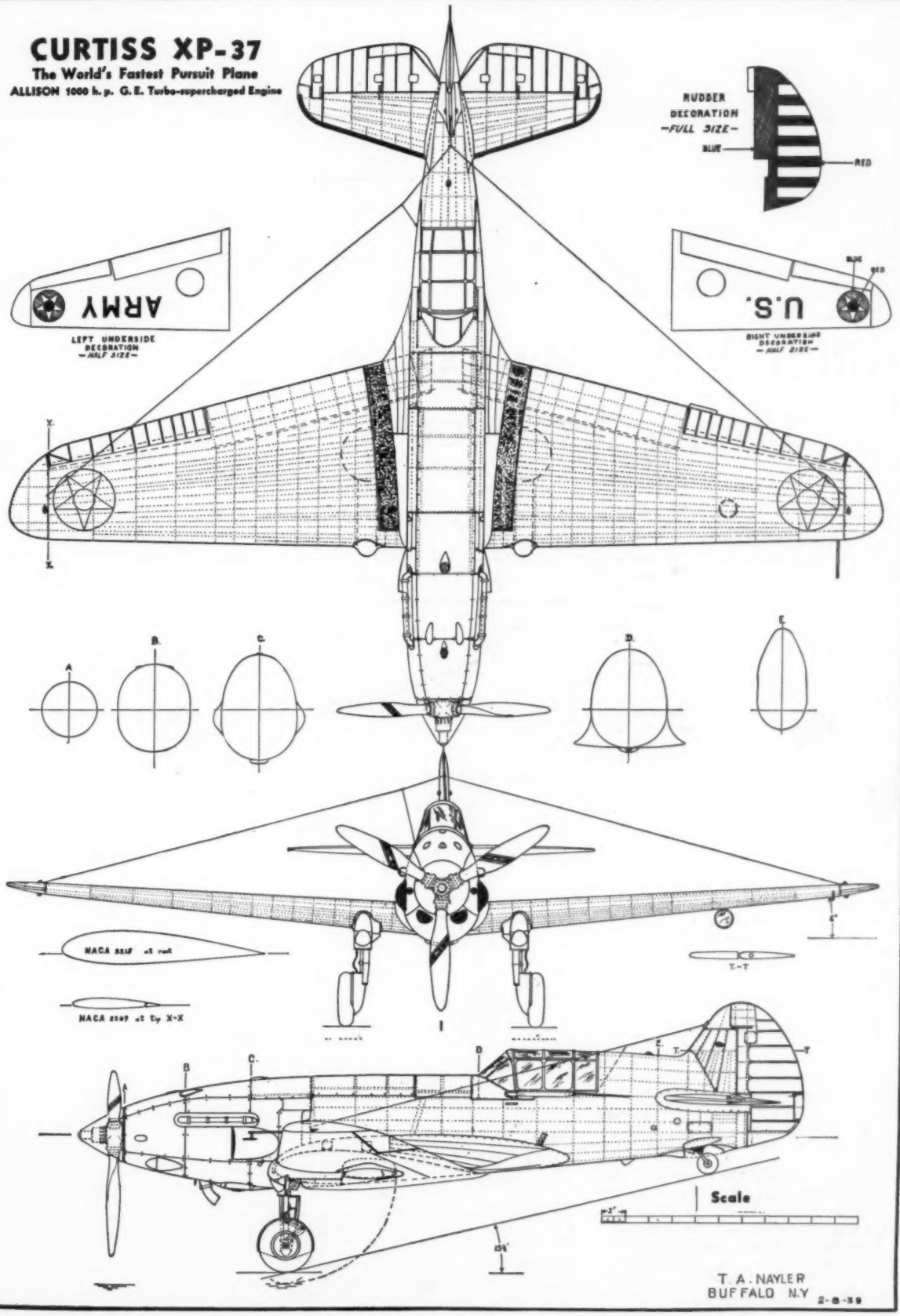


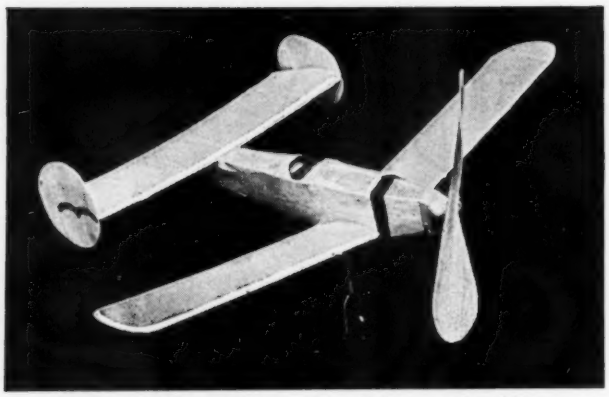
The Boeing B-9, the first of the low wing monoplane type of bombers. (1930)

CURTISS XP-37

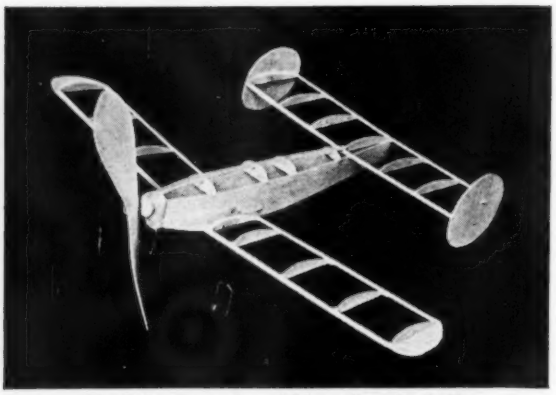
The World's Fastest Pursuit Plane

ALLISON 1000 h. p. G. E. Turbo-supercharged Engine





The large lifting stabilizer gives efficiency and stability.



The balsa frame is quickly and easily built.

Building the Mauboussin Flying Tandem

An All-balsa Flying Scale Model that Is Unique in Its Design, Easy to Build and Which Offers Opportunity for Interesting Experiments

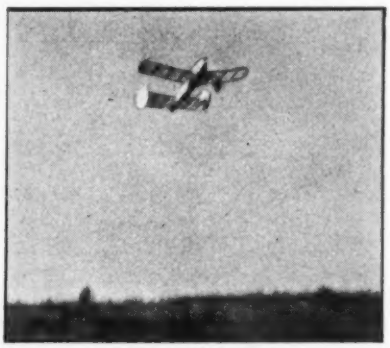
By HERBERT K. WEISS

THE famous "Flying Flea" isn't the only successful light plane nowadays with tandem tendencies. M. Pierre Mauboussin has turned out a big-tailed job of more conventional design than the "Flea" which is attracting much favorable comment among French sporting pilots. The performance of this little ship is not to be sneezed at. Powered with a 40 hp. Train engine, the Mauboussin Hemiptere steps along at a top speed of 99.4 m.p.h., cruises at 84 m.p.h., and lands at the very low speed of 28 m.p.h. Cruising range is 335 miles, so that the owner of the "Hemiptere" can do a little more than puddle jump around airports. Service ceiling is 12,464 feet.

The model is of very simple construction and can be assembled in a few hours.

Fuselage

Begin the fuselage by using carbon paper to trace the outline of the sides on 1/32" sheet balsa. Make two sides. Cut out bulkheads C, D, E and F, from 1/32" sheet balsa, and A and B from 1/8" sheet balsa. Note that the 1/16" sq. balsa cross-pieces at the bottom of the fuselage are placed directly below each bulkhead and are the same width as the bulkhead. To assemble, cement the two sides together at the tail post which is 1/16" sq. Cement bulkhead C and the cross-piece below it in place. Add the remaining bulkheads and the nose piece which is carved to fit after assembly. Add the top and bottom stringer.



It is a remarkable flier.

Wings and Tail

The wing may be laid out on the plan. To make the left side simply transfer dimensions with a ruler. The stabilizer is built in one piece and cemented in place before covering. Trace the twin rudders on 1/32" sheet balsa and cut them out. Raise each front wing tip one inch for correct amount of dihedral.

(Continued on page 42)

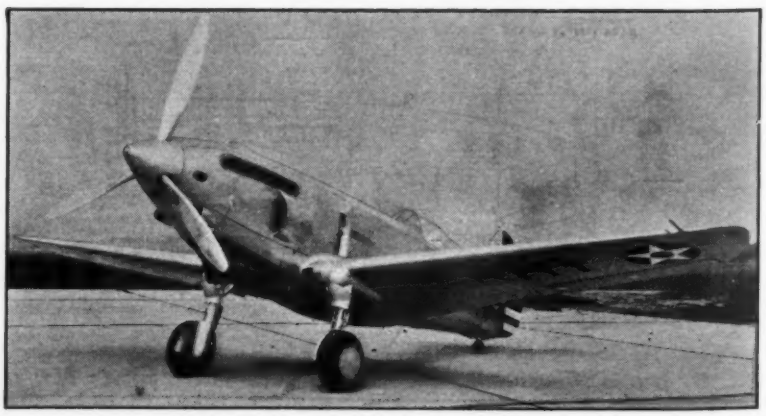
The Plane on the Cover

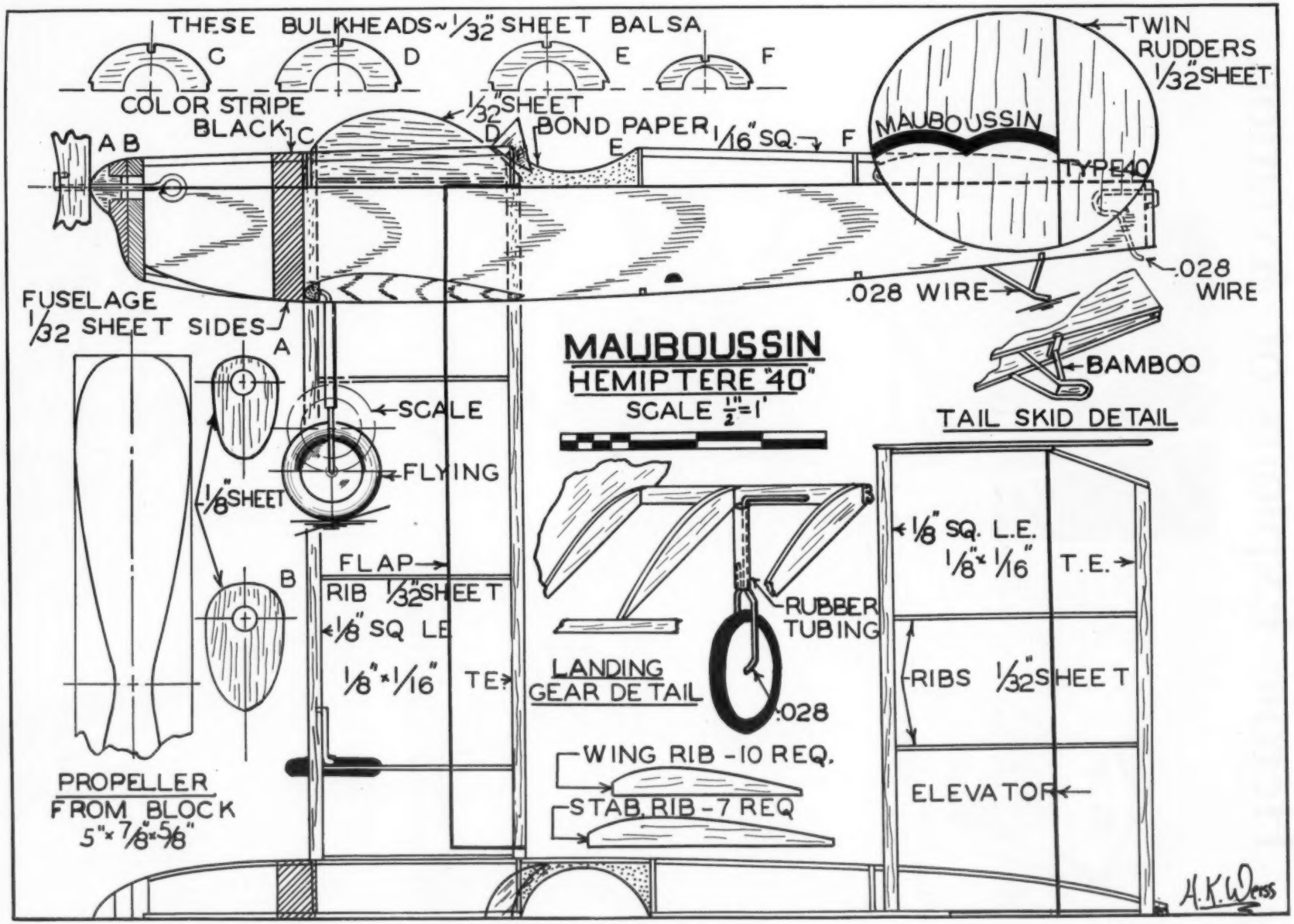
By ROBERT McLARREN

LATEST in a long line of famous Curtiss fighting planes is the ship shown on our cover this month: the Curtiss XP-37. This wicked little monoplane heralds in the return of the liquid-cooled, in-line engine over which the Army and Navy high command staffs have waged such a war of controversy. Power is delivered by the new Allison V-1760-C6 twelve-cylinder, geared, "V" engine which develops 1,000 horsepower at 2,600 revolutions per minute.

So pleased were Air Corps officials with the outcome of preliminary tests on the original model, they have placed an order with the Curtiss Aeronautical Division of the Curtiss-Wright Corporation of Buffalo, New York, for 13 service test models at a cost of $531,305. This is about $40,800 per plane which gives us an

(Continued on page 42)

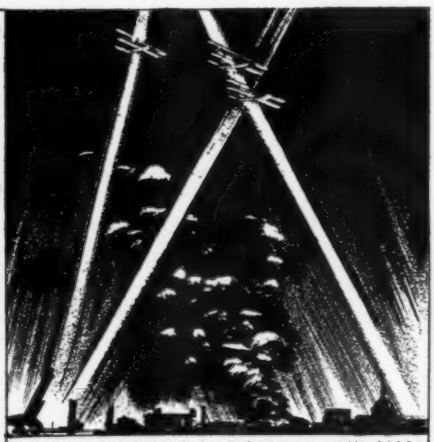



THESE BULKHEADS ~ 1/32" SHEET BALSA
C
D
E
F
COLOR STRIPE BLACK
1/32" SHEET
BOND PAPER
1/16" SQ.
A B
TWIN RUDDERS 1/32" SHEET
MAUBOUSSIN
TYPE 40
.028 WIRE
.028 WIRE
FUSELAGE 1/32 SHEET SIDES
MAUBOUSSIN
HEMIPTERE "40"
SCALE 1/2" = 1'
BAMBOO
TAIL SKID DETAIL
SCALE
FLYING
1/8" SHEET
FLAP
RIB 1/32" SHEET
1/8" SQ LE
1/8" x 1/16" TE
RUBBER TUBING
LANDING GEAR DETAIL
.028
1/8" SQ. L.E.
1/8" x 1/16" T.E.
RIBS 1/32" SHEET
WING RIB - 10 REQ.
STAB. RIB - 7 REQ
ELEVATOR
PROPELLER FROM BLOCK
5" x 7/8" x 5/8"
A.K. Weiss

Heroic Exploits of Aviation

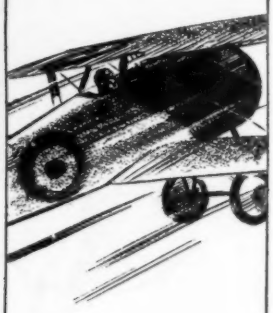
Adjutant THIEFFRY WAS ONE OF THE PREMIER BELGIAN ACES

FORCED DOWN AND CAPTURED WHILE ON PATROL, THIEFFRY CHAFED IN PRISON, UNTIL HE FOUND AN OPPORTUNITY TO ESCAPE. HE CROSSED INTO HOLLAND, WHERE HE WAS INTERNED FOR A TIME. HE EVENTUALLY REJOINED HIS COMRADES

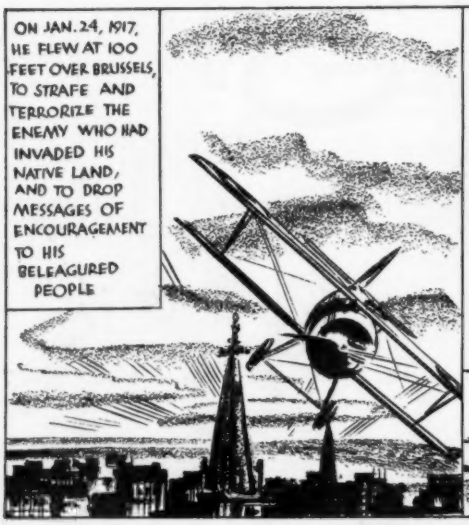


HE BEGAN HIS CAREER AS A BOMBER, AND MADE MANY LONG NIGHT FLIGHTS OVER THE LINES, BOMBING AMMUNITION DUMPS AND ENEMY CONCENTRATIONS.

ON DEC. 16, HE BEGAN TRAINING IN THE FAMOUS NIEUPORT, WITH WHICH HE WAS LATER TO DISTINGUISH HIMSELF.

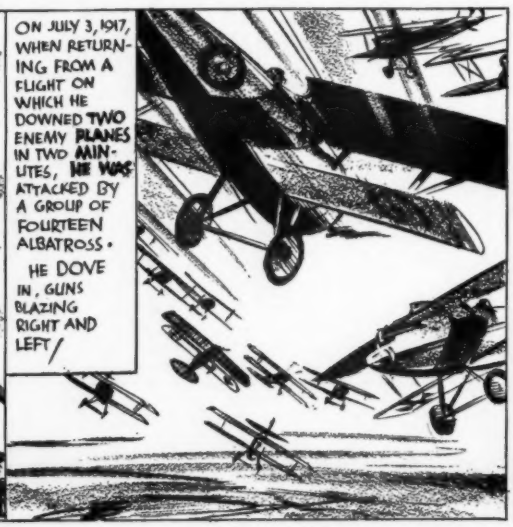


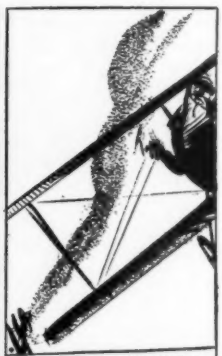
ON JAN. 24, 1917, HE FLEW AT 100 FEET OVER BRUSSELS, TO STRAFE AND TERRORIZE THE ENEMY WHO HAD INVADED HIS NATIVE LAND, AND TO DROP MESSAGES OF ENCOURAGEMENT TO HIS BELEAGURED PEOPLE



ON JULY 3, 1917, WHEN RETURNING FROM A FLIGHT ON WHICH HE DOWNED TWO ENEMY PLANES IN TWO MINUTES, HE WAS ATTACKED BY A GROUP OF FOURTEEN ALBATROSS.

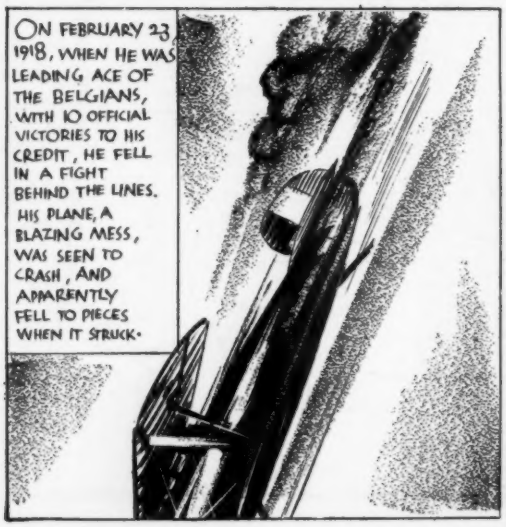
HE DOVE IN, GUNS BLAZING RIGHT AND LEFT!





HE KNOCKED DOWN TWO OF THEM. THE OTHERS WERE SO AMAZED, THEY DID NOT PRESS THEIR NUMERICAL ADVANTAGE, AND THIEFFRY SLIPPED AWAY TO SAFETY.

ON FEBRUARY 23, 1918, WHEN HE WAS LEADING ACE OF THE BELGIANS, WITH 10 OFFICIAL VICTORIES TO HIS CREDIT, HE FELL IN A FIGHT BEHIND THE LINES. HIS PLANE, A BLAZING MESS, WAS SEEN TO CRASH, AND APPARENTLY FELL TO PIECES WHEN IT STRUCK.



HE WAS REPORTED KILLED, AND HIS TRUE FATE WAS NOT KNOWN UNTIL A FEW DAYS LATER

THE GERMANS ANNOUNCED THAT THEY HAD CAPTURED THE BELGIAN! HIS ESCAPE FROM A FLAMING DEATH WAS MIRACULOUS, AND HIS CAPTURE ENDED THE FIGHTING CAREER OF ONE OF THE MOST COLORFUL OF THE WAR ACES

What Is My Gas Job's Performance?

A Graphical System of Determining the Wing Area and Weight of a Gas Model That Will Give the Greatest Possible Performance

By CHARLES HAMPSON GRANT

IN the preceding article the size of model that will give a maximum performance has been estimated by means of a careful performance comparison of various sizes of existing gas models. The accuracy of this estimate was checked by means of the general performance formula:

$$F = \frac{(R.P.M.)\ A.Cu}{W^2}.$$

the meaning and significance of which has been explained. It was found that the estimated size of 7 sq. ft. area and 3.5 lbs. to 4 lbs. of total weight would give close to a maximum performance.

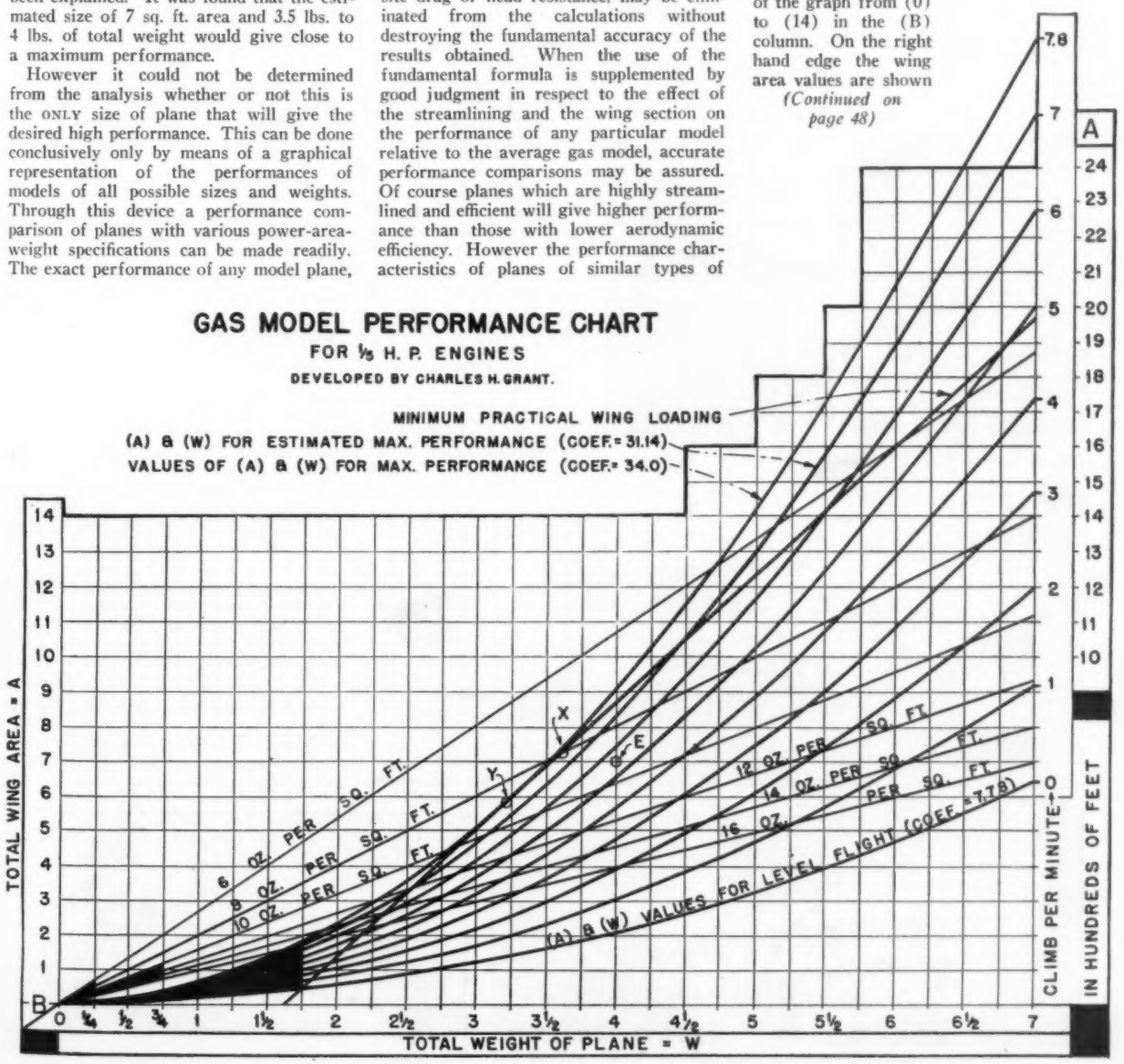
However it could not be determined from the analysis whether or not this is the ONLY size of plane that will give the desired high performance. This can be done conclusively only by means of a graphical representation of the performances of models of all possible sizes and weights. Through this device a performance comparison of planes with various power-area-weight specifications can be made readily. The exact performance of any model plane, based on these fundamental design factors may be determined. At the bottom of this page such a graph is shown.

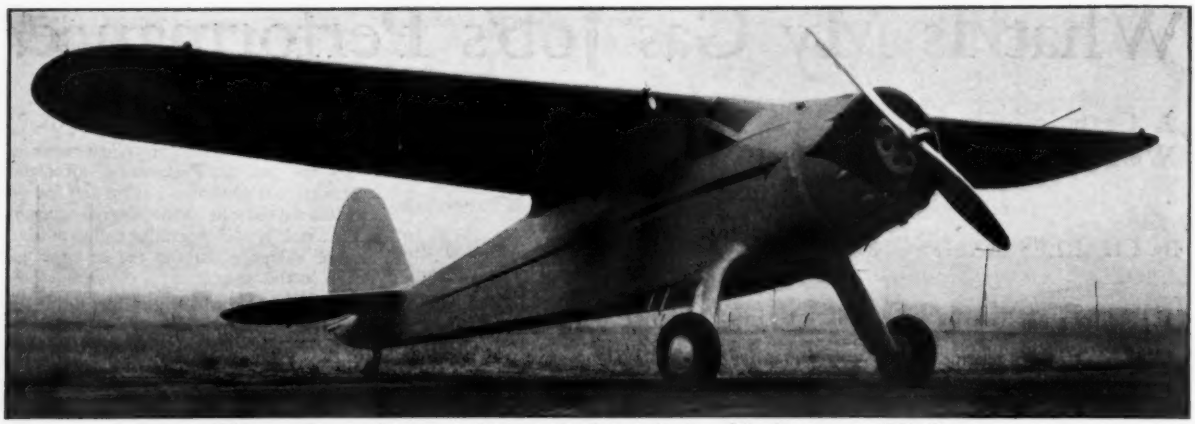
If the graph should be plotted according to variations of the many factors entering the problem of flight, it would be unnecessarily complicated. It is sufficient for fairly accurate results to consider only the fundamental factors of area, weight and power which govern the flight capacity of a plane. Factors such as variations of lift with different wing sections, variations of parasite drag or head resistance, may be eliminated from the calculations without destroying the fundamental accuracy of the results obtained. When the use of the fundamental formula is supplemented by good judgment in respect to the effect of the streamlining and the wing section on the performance of any particular model relative to the average gas model, accurate performance comparisons may be assured. Of course planes which are highly streamlined and efficient will give higher performance than those with lower aerodynamic efficiency. However the performance characteristics of planes of similar types of design and construction are given accurately by the graph. Performance of planes which are not of similar design and are not streamlined to the same degree may be determined by a comparative estimate based on the values given for the *average* gas model in the graph.

Now let us see what the graph can tell us about our gas models in general; and in particular, whether or not the previous estimate of the most efficient size for the gas model being outlined, is accurate.

The first points to note concerning the performance chart is that possible plane weights are indicated at the bottom and are scaled horizontally. Possible total wing areas are scaled vertically and are indicated at the left hand edge of the graph from (0) to (14) in the (B) column. On the right hand edge the wing area values are shown

(Continued on page 48)


GAS MODEL PERFORMANCE CHART
FOR 1/5 H. P. ENGINES
DEVELOPED BY CHARLES H. GRANT.
MINIMUM PRACTICAL WING LOADING
(A) & (W) FOR ESTIMATED MAX. PERFORMANCE (COEF.= 31.14)
VALUES OF (A) & (W) FOR MAX. PERFORMANCE (COEF.= 34.0)
6 OZ. PER SQ. FT.
8 OZ. PER SQ. FT.
10 OZ. PER SQ. FT.
12 OZ. PER SQ. FT.
14 OZ. PER SQ. FT.
16 OZ. PER SQ. FT.
(A) & (W) VALUES FOR LEVEL FLIGHT (COEF.=7.78)
X
Y
E
TOTAL WING AREA = A
TOTAL WEIGHT OF PLANE = W
CLIMB PER MINUTE→0 IN HUNDREDS OF FEET
A
B
0 ¼ ½ ¾ 1 1½ 2 2½ 3 3½ 4 4½ 5 5½ 6 6½ 7
7.8

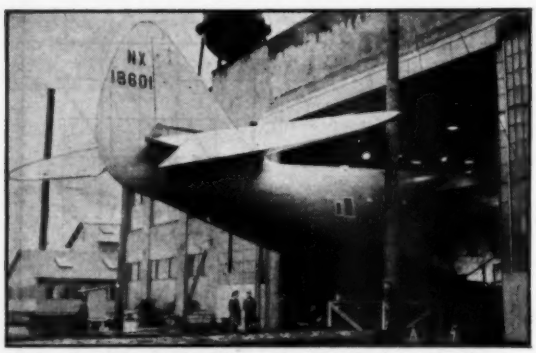


The new Cessna Airmaster with a newly designed tail and landing gear. (Morrison)

Frontiers of Aviation

By ROBERT C. MORRISON

THE constant development of the metal airplane has taken a temporary recess as wood construction once more comes to the fore. These days there are many companies giving wood very serious consideration because of the low cost, the excellent outside finish that may be obtained, and the new Bakelite process that is now put into use. The undoubted success of several wooden airplanes now in the completion stage is going to turn many an aeronautical engineer's thoughts back to wood construction until the metal situation unfolds itself into simpler terms of cost and manufacture.



The tail of the Boeing No. 314 emerges from the factory door. (Williams)

Spruce, the most suitable wood for aircraft construction, has at last been made into a practical plywood. The process in brief is that dry glue in thin sheet form is placed between two sheets of spruce veneer. The would-be laminated wood is then bent into the required shape and intense heat applied, melting the glue. Then when the glue hardens the plywood holds its shape. Glue itself has now been developed to the extent that no nails need be used in the joints where it is applied because of its great strength and the manner in which it withstands heat and water. Modern wooden airplanes will not have a single nail in them!

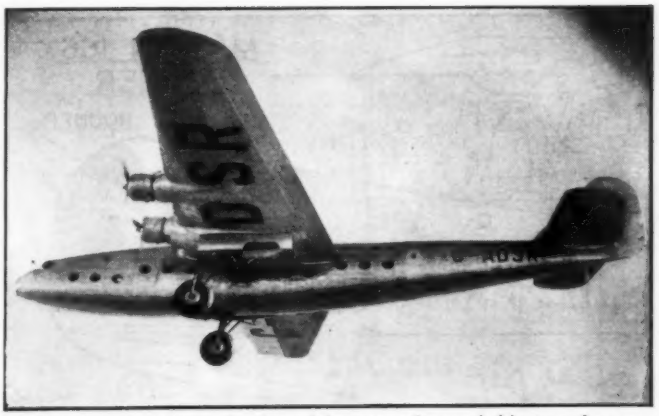
Certain manufacturers can bend and mold wood as if it were clay and obtain the utmost accuracy. By adding to this sudden success the use of Bakelite, they are able to put on the finishing touches to give the airplane unheard-of skin smoothness. The Bakelite process is simply a new thermoplastic molding material which will withstand heat temperatures up to 176 degrees F. It will even resist a blow torch's hot flame! As the plastic shrinks very little when molded, accuracy is one of its prime factors. Thus the Bakelite makes a very good protective coating for the wood. Incidentally it might give the wood plane manufacturer hopes of selling his airplanes once more in places like South America and Africa where they have now gone all-metal. With the former unprotected wood construction, mushrooms, insects and other forms of fungi were found to grow in utmost abundance inside the airplane structure. Warpage from dampness inside the wing was many times very embarrassing to the airplane owner, also.

One use of Bakelite now employed on a completed airplane is that after the plywood covering has been put on then covered with thin fabric, the Bakelite is applied giving a surface as smooth as that on an automobile.

A new 36 ft. tailless plane of 75 hp. designed by W. F. McGinty. (International)

The new Douglas B-18 Army bomber. (G. Williams)

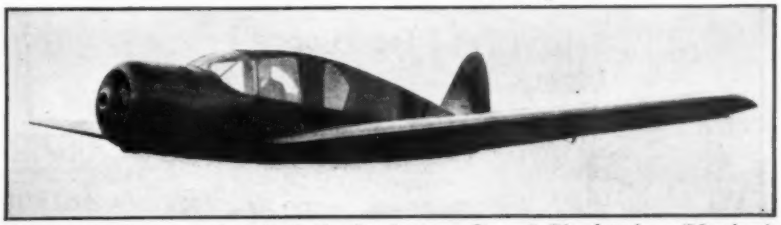
The 1252 hp. Seversky S-2, Army pursuit plane. (Williams)



Britain's largest airliner, the first of fourteen planes of this type that are being built for Imperial Airways. It will carry about 40 passengers. (International)

A model of the new Douglas DC-4, 65,000 pound airliner which has a speed of 240 m.p.h. The four engines develop 5600 hp.

Significant New Structural Developments and Highlights of the Latest Military and Commercial Planes—How to Build a Scale Model of the Martin-166 Bomber



The latest Bellanca creation, the Junior for the sport flier. LeBlond 90 hp. (Morrison)

The new Fairchild 46 uses what is known as the Duramold process. A whole side of the fuselage may be molded at one time and then put on the ship. When the airplane is completed it looks as if it had just come out of a clay mold as a solid unit, and its sharp, even lines will go a long way towards selling the airplane.

The new Fairchild 46 is a development of the 45 and carries a pilot and four passengers. It is a low-wing ship with split flaps and a well faired fixed landing gear. In the nose either a 6-cylinder 165 hp., 12-cylinder 305 hp., or 420 hp., inverted in-line Ranger engine may be installed. They all give very small frontal area and thus the fuselage is able to have very good lines, tapering aft to a sharp "pencil point." With the 12-cylinder 450 vee geared and supercharged Ranger engine the airplane has a cruising speed of 203 m.p.h. with full load of passengers, 223 lb. of baggage and a cruising range of 1,000 miles!

The vertical tail is set noticeably forward of the horizontal tail so that it will not be blanketed by the stabilizer in a spin. Construction of the airplane is said to be wood throughout. This new Bakelite Fairchild should prove to be one of the most popular sportplanes of 1938.

Another wood Bakelite airplane is Vance Breese's new ship built by the Bennett Aircraft Company which we have mentioned in former issues. It is very probable that this mid-wing airplane may be developed into a military ship for export because of its structural strength for such work and the low cost and ease of building. Another important item is the small length of time needed to build each unit.

And then another person who is making use of the same type of construction is none other than Kieth Rider, famed builder of the racing planes that bear his name. He is now well under way with the construction of a racing plane employing large cement molds to shape out the thermoplastic material. It is said that Mr. Rider will build several of these racers after the first is tested at low cost, and it may be a

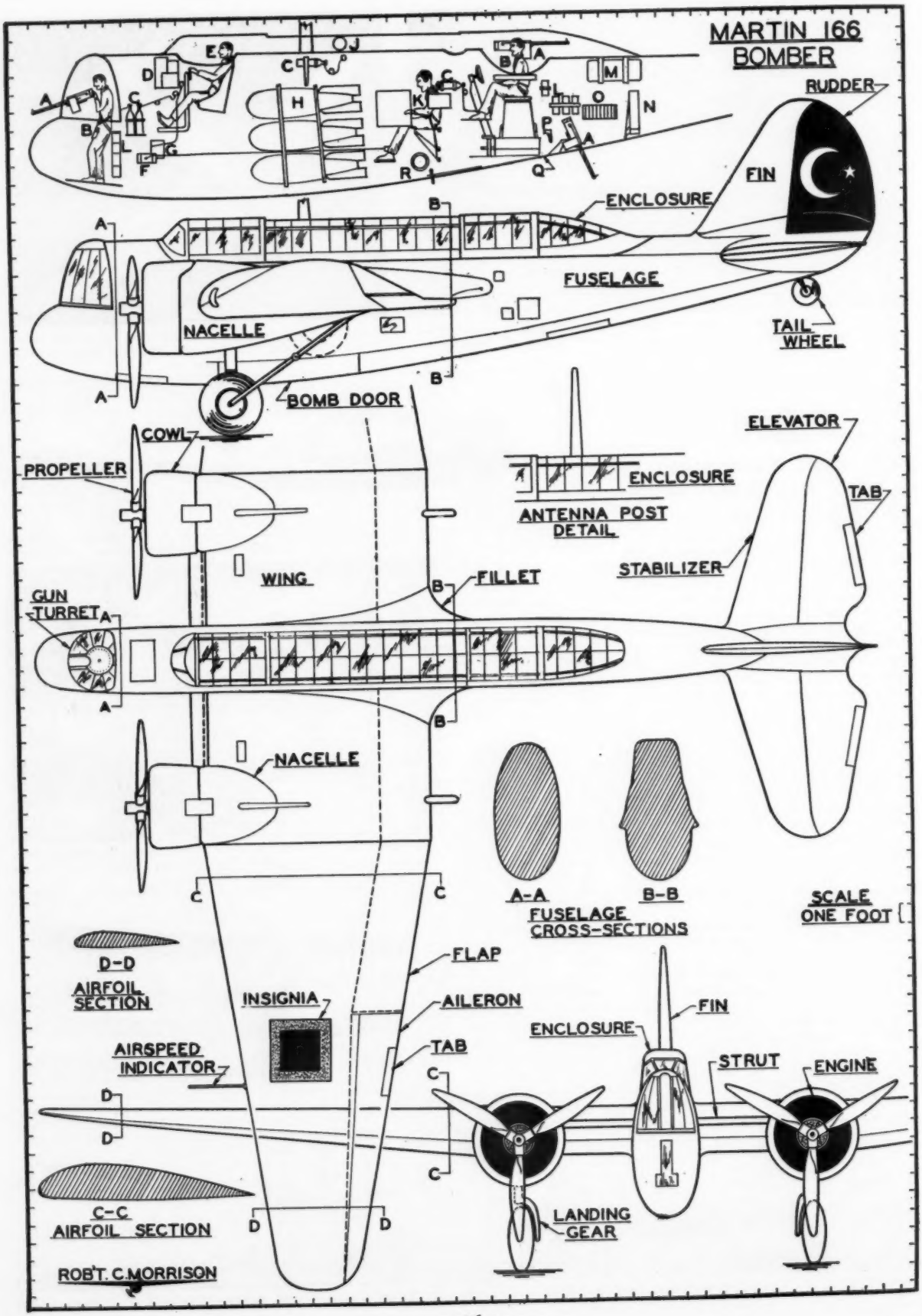
(Continued on page 51)

The new No. 314 Boeing giant flying boat, the South Seas Clipper, at the Boeing factory, as it is being made ready for its wings. (Williams)

The Koolhoven F.K.52 reconnaissance plane, used by the Dutch Airforce. It is similar to Douglas U.S. Army planes. (Roona)

The German 100 hp. Arado A.R. 99 trainer (McRae)

The new Timm transport with 3 wheel gear and flaps. (Morrison)


MARTIN 166
BOMBER
RUDDER
FIN
ENCLOSURE
FUSELAGE
NACELLE
TAIL WHEEL
BOMB DOOR
COWL
PROPELLER
WING
FILLET
GUN TURRET
NACELLE
ELEVATOR
TAB
STABILIZER
ENCLOSURE
ANTENNA POST DETAIL
A-A
B-B
FUSELAGE CROSS-SECTIONS
SCALE ONE FOOT
D-D
AIRFOIL SECTION
INSIGNIA
FLAP
AILERON
TAB
AIRSPEED INDICATOR
C-C
AIRFOIL SECTION
ENCLOSURE
FIN
STRUT
ENGINE
LANDING GEAR
ROBT. C. MORRISON

Can You Solder?

How to Correctly Perform an Important Operation Often Necessary in Model Building, One Which Causes Damage When Improperly Executed

By JAMES F. CONDON, JR.

THE average gas model builder of today is required to know far more about the proper use of tools than even the most expert builder of a few years ago. The reason is obvious, for the more complicated physical structure of this type of plane demands a working knowledge of gas engines, carpentry, sheet metal work and soldering, just to mention a few.

This last mentioned art, namely that of soldering, is too often taken for granted or overlooked completely by some model "bugs" who do not fully realize the important part it plays in maintaining an efficient ignition circuit. This is proven time after time at all meets by the too large number of planes which suddenly develop motor trouble.

How many times have you heard the owners of these planes offer the same excuse—"I don't know what's wrong, she was running okay at home, but every time I come out to the airport something goes wrong. She just won't perk."

Closer examination of these planes invariably reveals sloppy motor installations. I've seen some motors held in place by rubber bands, others bolted in place without removing the wooden skids upon which they are mounted at the factory, and others mounted with part of the skids hacked off. Most of these installations appear to be the result of poor planning on the part of the builder and look as though the motor was added as an afterthought. Naturally in this type of installation not much consideration is given to the electrical circuit, with the result that the efficiency of this important system is impaired.

In order to obtain the maximum efficiency from an electrical circuit all connections should be soldered. The reason for this is very simple. As you probably know, the oxygen in the atmosphere attacks the surface of a metal and combines with it to form an oxide of the metal. Now these oxides, unlike the metals which they cling to, are notoriously poor conductors and any connection in a circuit made without first removing this coating causes a loss in current.

Scraping the wires to remove the oxide will not do much good, for the deposit is formed as soon as the air comes in contact with the exposed metal. Thus a wire cleaned in this manner is completely oxidized by the time the scraper is withdrawn.

In brief an efficient connection can be made only when the oxide is removed and the wires united *before* the air can attack and impair the performance of this new bond.

Soldering is the only method of doing this, but this same metallic oxide makes it impossible for the solder to stick to the metal.

These last two sentences sound a bit contradictory, so let me explain how it is done.

A chemical removes the coating while the solder spreads over and unites with the metal before the air can again do its dirty work. This chemical is called a flux and may be one of two different types, each of which reacts in a different way. An acid flux is a pasty substance which contains a chloride of either ammonia or zinc mixed with vaseline or animal fats. In use, the paste is spread over the surface to be soldered and when heat is applied, it unites with the oxide and is volatilized or transformed into a vapor which escapes.

A paste similar in appearance is composed of resin dissolved in alcohol. In use this paste is spread around the surface to be soldered and the oxide is removed by reduction. That is, the oxygen is absorbed and the oxide is transformed back into the base metal. This resin flux is designed for use around switchboards and also for wiring radio sets, or whenever a light deposit is likely to be encountered. It will not remove a heavy deposit and is more difficult to use, therefore it is not to be desired for work around a gas job.

So-called core solders contain one of the above mentioned fluxes in the hollow center of the solder itself and no additional flux should be necessary. However in some instances this core boils away before it has a chance to remove the oxide and the result is the same as though no flux were used at all.

By this time you should have a pretty definite idea that the best method is to use an acid paste with a solid bar of solder.

The only tools needed are a small file, a knife and a soldering iron, electric or otherwise. A blow torch may be used but I would advise using an electric iron if possible for they remain cleaner and will be safer around your workshop than any using an open flame.

Now to get down to the mechanics of soldering. First clean your iron, using a file if necessary. Then after heating it until it is sufficiently warm to melt solder instantly, the tip should be tinned by first dipping it in the paste and then applying a few drops of solder and allowing them to spread over all sides of the tip.

If an electrical connection is to be made, about a half-inch of insulation is scraped from the end of each wire with the knife and the leads are twisted together. Spread a small amount of paste lightly over the splice making sure that all surfaces to be soldered are covered.

Next the iron is applied and as soon as the paste or flux begins to boil or vaporize, the solder is touched to the iron at the point where it is held against the wires. The melted drops of solder will then run over all parts of the connection which had previously been coated with the paste.

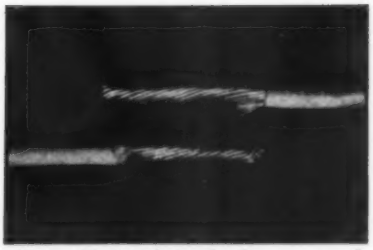


Fig. 1. The insulation has been removed and the strands twisted.

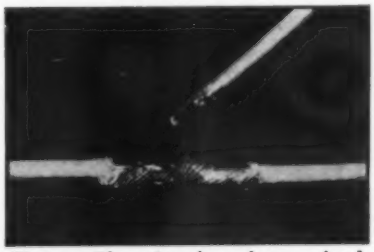


Fig. 2. The wires have been twisted together and the flux applied.

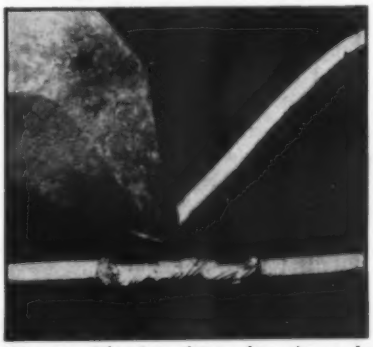


Fig. 3. The iron heats the wire and when the flux foils, the solder is applied.

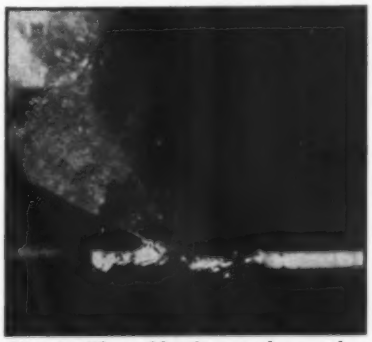


Fig. 4. The solder is spread over the connection with the iron.

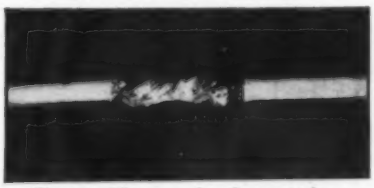
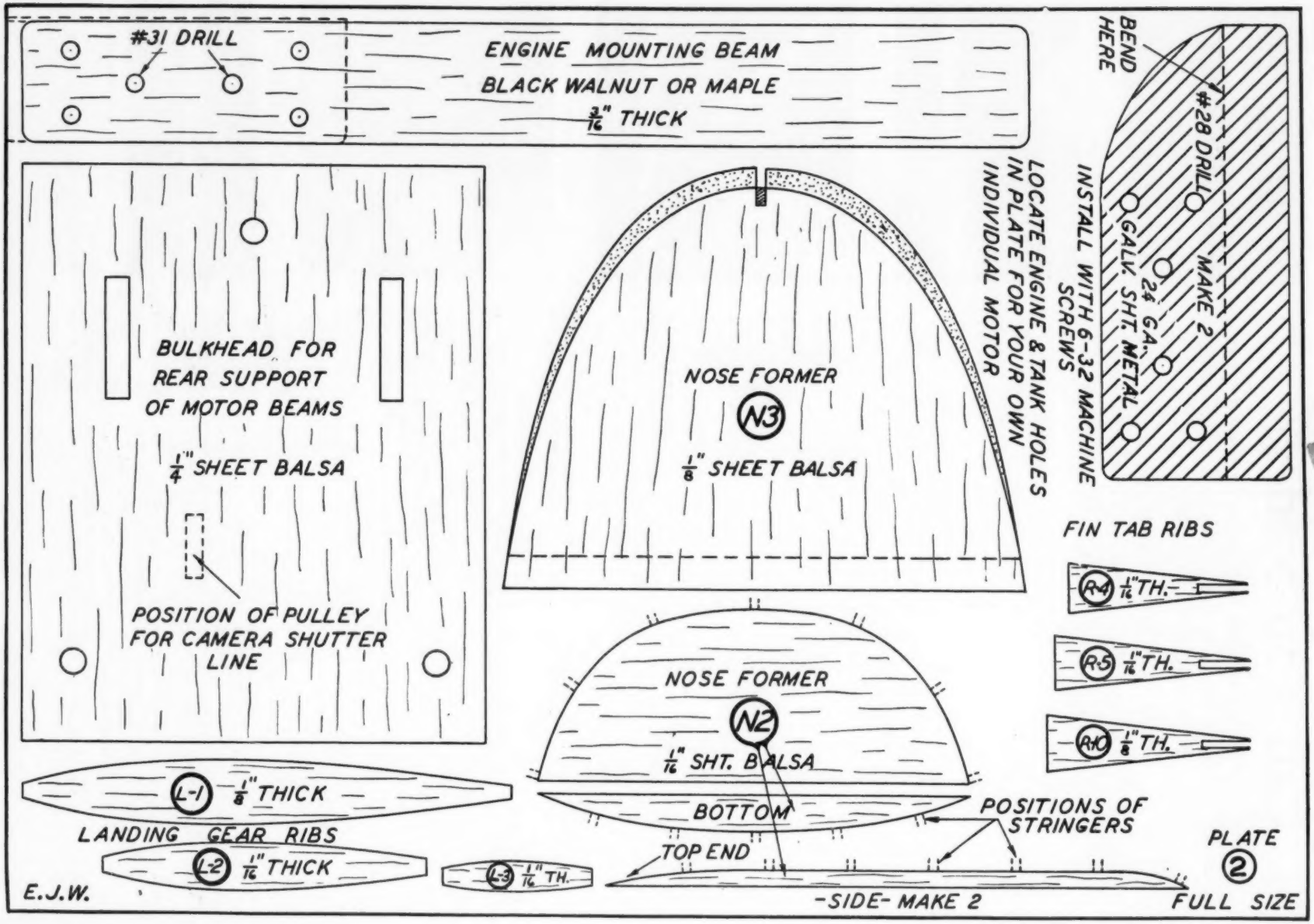
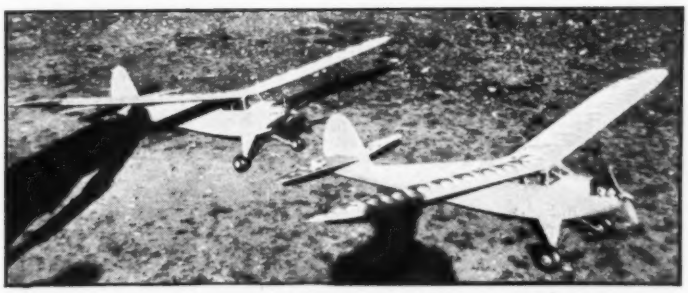


Fig. 5. The completed connection.

Running the iron lightly over the joint will dress up or spread the solder more evenly, making a better and stronger connection.

(Continued on page 44)


#31 DRILL
ENGINE MOUNTING BEAM
BLACK WALNUT OR MAPLE
3/16" THICK
BEND HERE
#28 DRILL
MAKE 2
24 GA. GALV. SHT. METAL
INSTALL WITH 6-32 MACHINE SCREWS
LOCATE ENGINE & TANK HOLES IN PLATE FOR YOUR OWN INDIVIDUAL MOTOR
BULKHEAD FOR REAR SUPPORT OF MOTOR BEAMS
1/4" SHEET BALSA
POSITION OF PULLEY FOR CAMERA SHUTTER LINE
NOSE FORMER
N3
1/8" SHEET BALSA
FIN TAB RIBS
R-4 1/16" TH.
R-5 1/16" TH.
R-10 1/8" TH.
NOSE FORMER
N2
1/16" SHT. BALSA
BOTTOM
POSITIONS OF STRINGERS
TOP END
L-1 1/8" THICK
LANDING GEAR RIBS
L-2 1/16" THICK
L-3 1/16" TH.
E.J.W.
-SIDE- MAKE 2
PLATE 2
FULL SIZE



Heavenly twins; two camera models; identical in looks and performance.

How to Build A Gas-powered Camera Model

Complete Information and Plans From Which You May Build a Plane That Will Take Aerial Photos Or Serve As an Efficient Contest Model

By ELBERT J. WEATHERS

PART NO. 1

HERE, Mr. Gas Model Enthusiast, is a plane which has been thoroughly proven from several important angles. It is a ship of 8 foot wing span possessing the much sought after characteristics in present day gas models. As shown by past experience, it safely holds its own when being judged for construction, general design and clean lines in a precision contest. The take-off is very even and graceful and the climb, with the engine wide open or fairly much so, is nothing short of spectacular, considering its size. It has been observed on many occasions "going upstairs" at an angle approaching 30 to 35 degrees. The Grant X wing section and flying weight, (with full equipment, 5 lbs.) obviously have a lot of bearing on this feature. On the other hand, the engine can be throttled way down, giving flights very similar to a Taylor Cub. Thus is the flexibility with it in flight. The glide is super-flat and soaring on the mildest thermal is common. Under gliding conditions, the forward speed is very slow, and when ready to finally land, it comes in as gentle as a kitten, with little or no bounce.

The writer's original job was designed to have a perfect glide with both the wing and stabilizer in a fixed position and each absolutely neutral, relative to the neutral line of thrust. In other words, the only adjustment that has ever been made to it has been that of the tab in the fin, to adjust it for the wide circling to the right, after the motor cuts. Should anyone, upon completion of the model, find that gliding adjustments are imperative (which is a remote possibility if plans are carefully followed), it is suggested that small sheet aluminum tabs be made and installed on the trailing edge of the stabilizer to compensate.

Here she comes! The model taking off for a reconnaissance flight and an aerial photo.

There she goes! The ship climbing for altitude at the rate of 250 to 300 ft. per minute.

An aerial photo taken from the plane in flight. Note the wing tip, road and mountains.

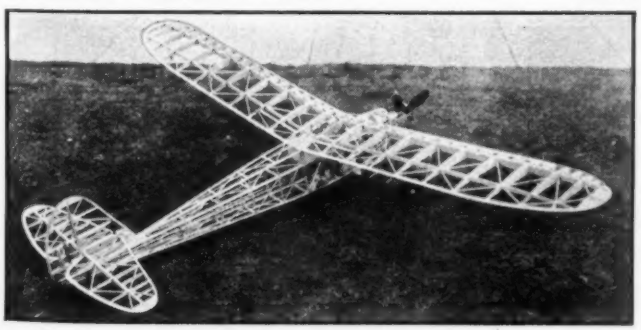
Each wing panel slides out of the center section after lock pins are removed and the tail surfaces detach likewise, as one unit, insuring maximum ease of transportation to the flying field.

The feature of being able to take aerial photos should prove of enough interest in itself to urge most gas modellers to try the model. It is probably the first gas model to obtain worth-while aerial photos. A standard Univex Model "A" camera is employed for this (very inexpensive, easy shutter action, and light weight) and makes surprisingly clear exposures considering the lens and flying speed (under power) of the model at the time of shutter action. When installed as shown, the left wing panel of the ship is included in the upper portion of each "shot," adding to the realism. This is clearly shown in the aerial pictures included in the article. The possibilities of taking photos from the air of gas model contests as your entry is flying overhead might also be mentioned in this connection.

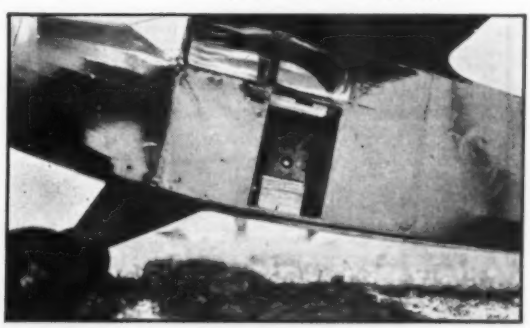
Specifications

Wing span	8 ft.
Wing chord	10½ in.
Wing area	967.8 sq. in.
Wing loading	.76 lb./sq. ft.
Aspect ratio of wing	9 to 1

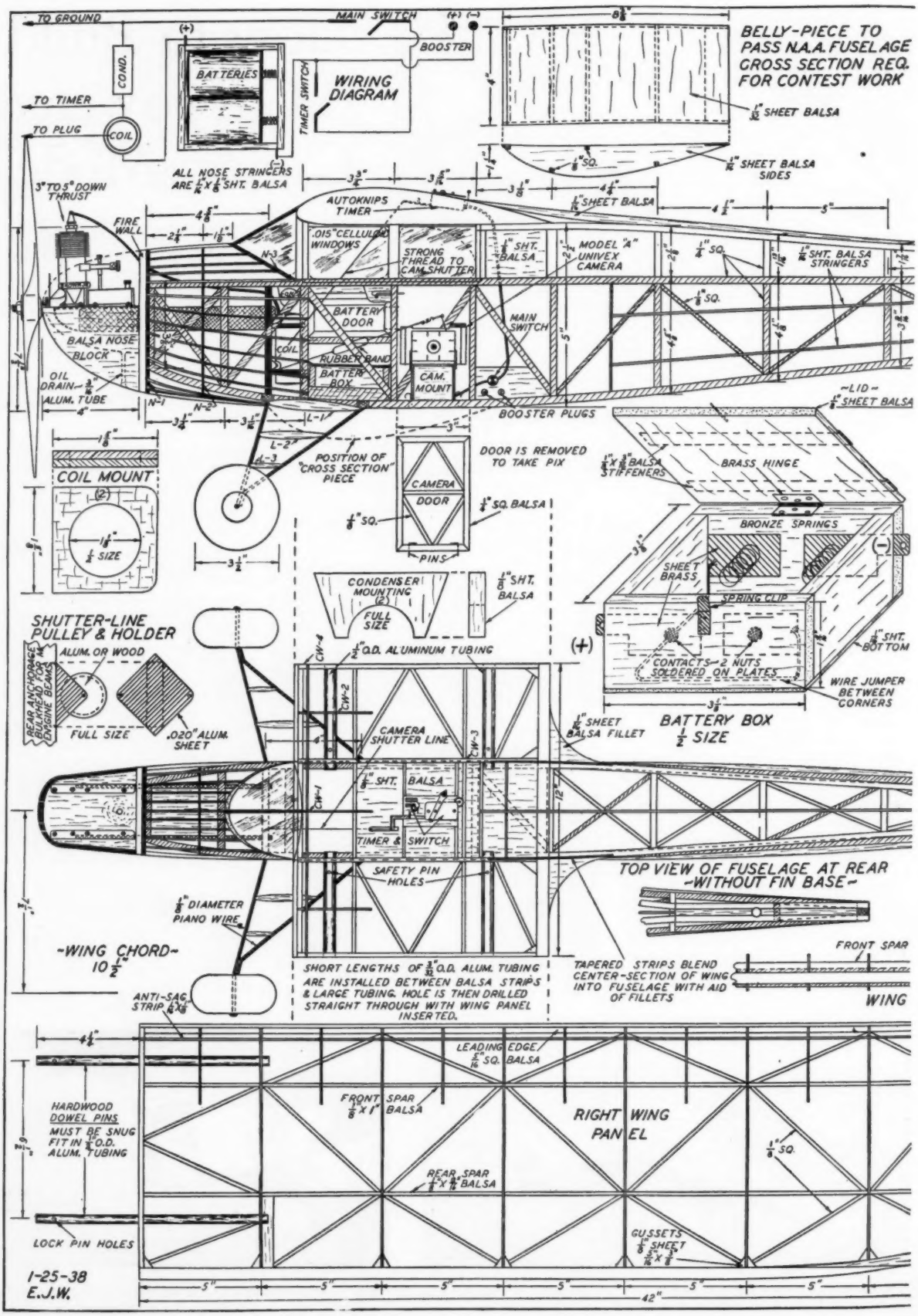
(Continued on page 40)

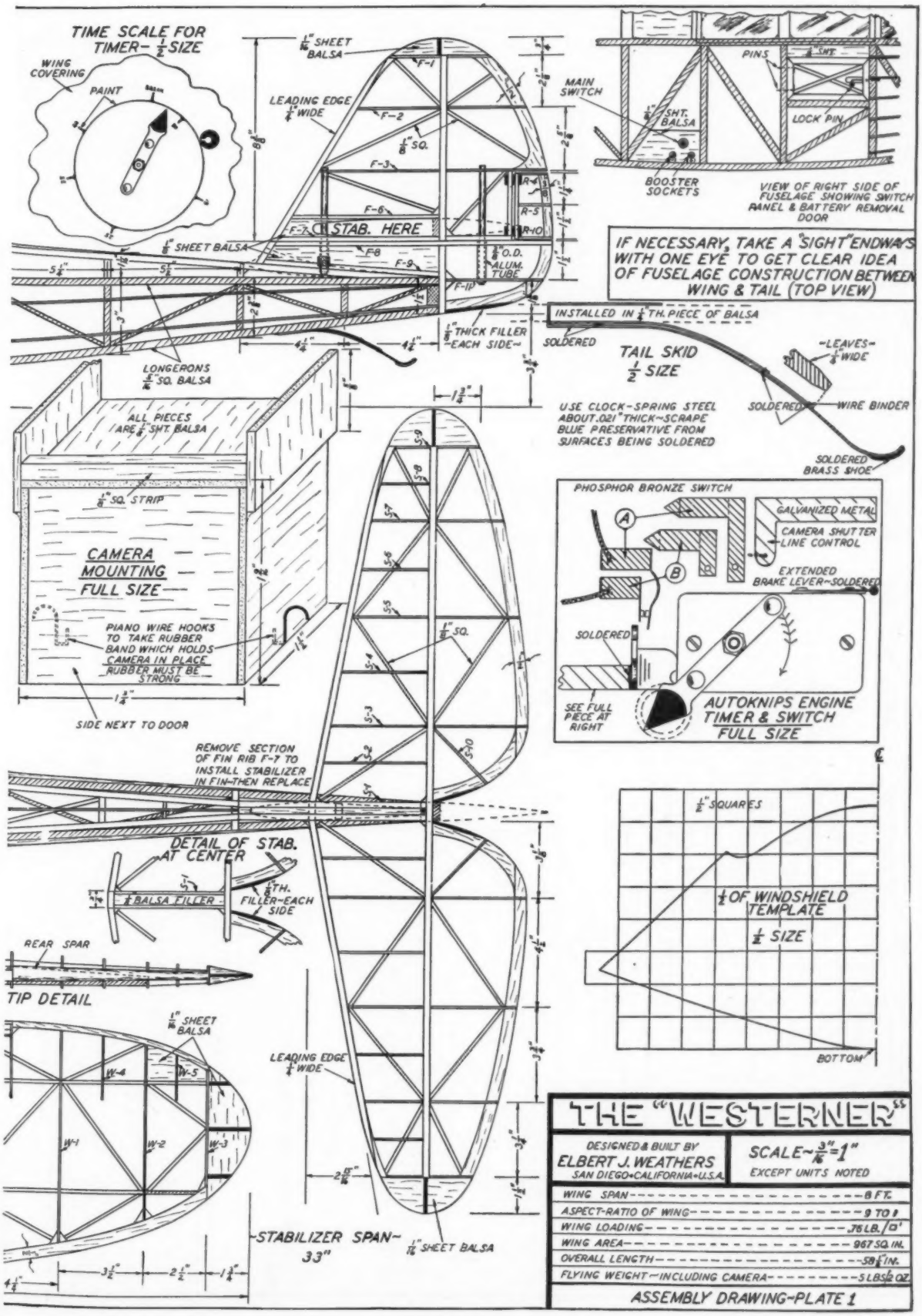


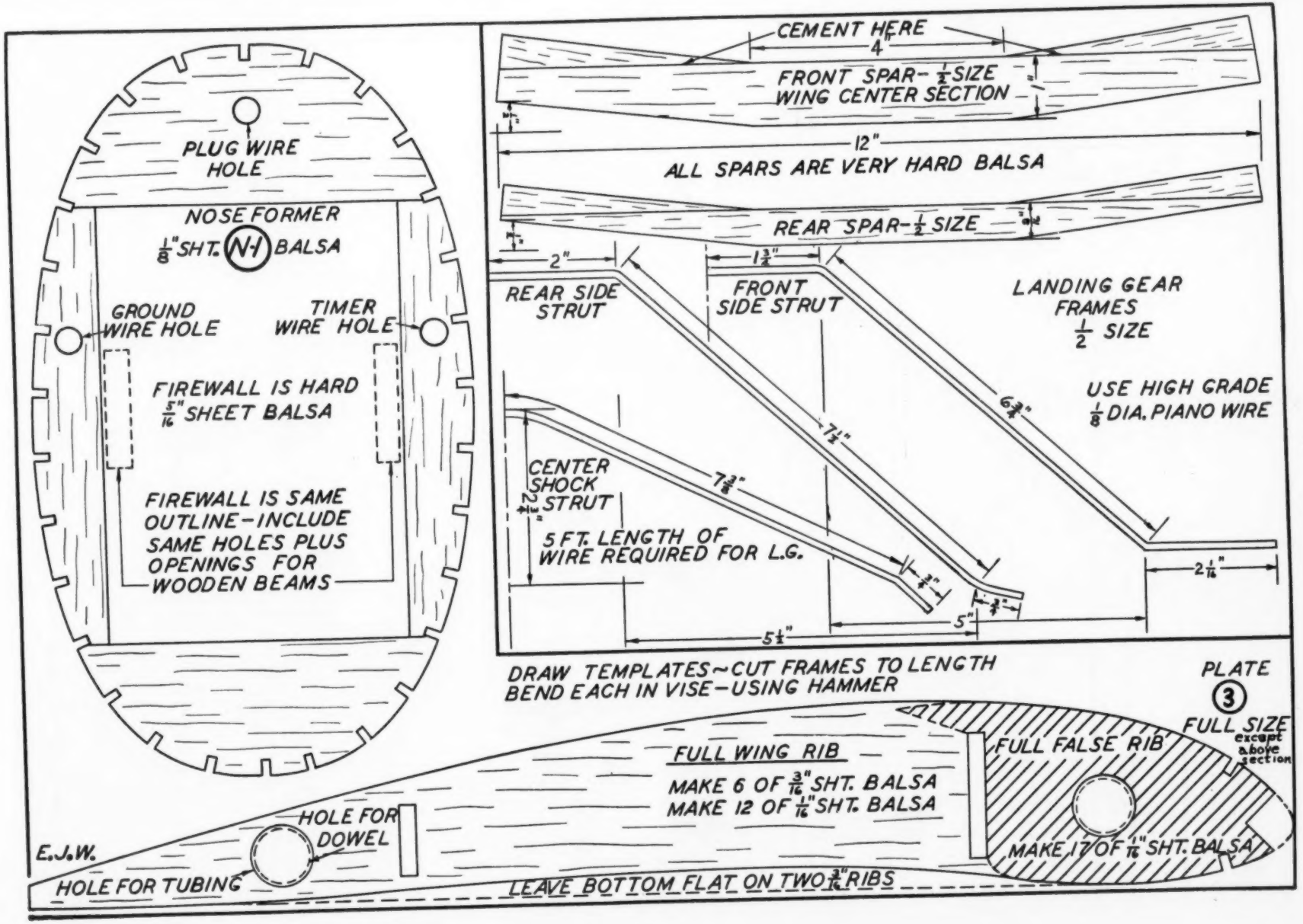
The structure of the camera model is carefully designed in detail. The cross bracing of wing and fuselage gives great strength.



The camera mounted in the fuselage of the plane. Pictures are taken through the opening in the side.


WIRING DIAGRAM
TO GROUND
MAIN SWITCH
BOOSTER
BATTERIES
COND.
COIL
TIMER SWITCH
TO TIMER
TO PLUG
ALL NOSE STRINGERS ARE 1/16 X 1/8 SHT. BALSA
3" TO 5" DOWN THRUST
FIRE WALL
AUTOKNIPS TIMER
.015 "CELLULOID WINDOWS
STRONG THREAD TO CAM SHUTTER
MODEL "A" UNIVEX CAMERA
BATTERY DOOR
RUBBER BAND
BATTERY BOX
CAM. MOUNT
MAIN SWITCH
BALSA NOSE BLOCK
OIL DRAIN
ALUM. TUBE
BOOSTER PLUGS
POSITION OF "CROSS SECTION" PIECE
DOOR IS REMOVED TO TAKE PIX
CAMERA DOOR
PINS
COIL MOUNT
1/4 SIZE
CONDENSER MOUNTING
FULL SIZE
SHUTTER-LINE PULLEY & HOLDER
ALUM. OR WOOD
REAR ANCHORAGE BULKHEAD FOR ENGINE BEAMS
FULL SIZE
.020" ALUM. SHEET
1/2" O.D. ALUMINUM TUBING
CAMERA SHUTTER LINE
TIMER & SWITCH
SAFETY PIN HOLES
1/8" DIAMETER PIANO WIRE
-WING CHORD-
10 1/2"
ANTI-SAG STRIP
SHORT LENGTHS OF 1/2" O.D. ALUM. TUBING ARE INSTALLED BETWEEN BALSA STRIPS & LARGE TUBING. HOLE IS THEN DRILLED STRAIGHT THROUGH WITH WING PANEL INSERTED.
BELLY-PIECE TO PASS N.A.A. FUSELAGE CROSS SECTION REQ. FOR CONTEST WORK
1/32" SHEET BALSA
1/8" SQ.
1/16" SHEET BALSA SIDES
1/16" SHEET BALSA
1/4" SQ.
1/16" SHT. BALSA STRINGERS
1/8" SQ.
-LID-
1/16" SHEET BALSA
1/16" X 1/8" BALSA STIFFENERS
BRASS HINGE
BRONZE SPRINGS
SHEET BRASS
SPRING CLIP
1/16" SHT. BOTTOM
CONTACTS-2 NUTS SOLDERED ON PLATES
WIRE JUMPER BETWEEN CORNERS
BATTERY BOX
1/2 SIZE
1/16" SHEET BALSA FILLET
1/8" SQ. BALSA
1/8" SHT. BALSA
TOP VIEW OF FUSELAGE AT REAR -WITHOUT FIN BASE-
TAPERED STRIPS BLEND CENTER-SECTION OF WING INTO FUSELAGE WITH AID OF FILLETS
FRONT SPAR
WING
HARDWOOD DOWEL PINS MUST BE SNUG FIT IN 1/2" O.D. ALUM. TUBING
LOCK PIN HOLES
LEADING EDGE 1/16" SQ. BALSA
FRONT SPAR 1/8 X 1" BALSA
RIGHT WING PANEL
REAR SPAR 1/16 X 1/2" BALSA
1/8" SQ.
GUSSETS 1/16" SHEET 3/4 X 1/8
1-25-38
E.J.W.
42"


TIME SCALE FOR TIMER- ½ SIZE
WING COVERING
PAINT
LEADING EDGE ¼" WIDE
1/16" SHEET BALSA
F-1
F-2
F-3
F-6
F-7
F-8
F-9
F-10
STAB. HERE
1/16" SHEET BALSA
LONGERONS 1/16" SQ. BALSA
1/8" THICK FILLER EACH SIDE
1/8" O.D. ALUM. TUBE
R-1
R-5
R-10
MAIN SWITCH
PINS
1/16" SHT. BALSA
LOCK PIN
BOOSTER SOCKETS
VIEW OF RIGHT SIDE OF FUSELAGE SHOWING SWITCH PANEL & BATTERY REMOVAL DOOR
IF NECESSARY, TAKE A "SIGHT" ENDWAYS WITH ONE EYE TO GET CLEAR IDEA OF FUSELAGE CONSTRUCTION BETWEEN WING & TAIL (TOP VIEW)
INSTALLED IN 1/16 TH. PIECE OF BALSA
SOLDERED
TAIL SKID ½ SIZE
-LEAVES- 1/8" WIDE
SOLDERED
WIRE BINDER
SOLDERED BRASS SHOE
USE CLOCK-SPRING STEEL ABOUT .021" THICK-SCRAPE BLUE PRESERVATIVE FROM SURFACES BEING SOLDERED
ALL PIECES ARE 1/16" SHT. BALSA
1/8" SQ. STRIP
CAMERA MOUNTING FULL SIZE
PIANO WIRE HOOKS TO TAKE RUBBER BAND WHICH HOLDS CAMERA IN PLACE RUBBER MUST BE STRONG
SIDE NEXT TO DOOR
PHOSPHOR BRONZE SWITCH
A
B
GALVANIZED METAL
CAMERA SHUTTER LINE CONTROL
EXTENDED BRAKE LEVER-SOLDERED
SOLDERED
SEE FULL PIECE AT RIGHT
AUTOKNIPS ENGINE TIMER & SWITCH FULL SIZE
REMOVE SECTION OF FIN RIB F-7 TO INSTALL STABILIZER IN FIN-THEN REPLACE
DETAIL OF STAB. AT CENTER
1/8 TH. FILLER-EACH SIDE
1/16 BALSA FILLER
REAR SPAR
TIP DETAIL
1/16" SHEET BALSA
W-1
W-2
W-3
W-4
W-5
LEADING EDGE ¼" WIDE
STABILIZER SPAN- 33"
1/16" SHEET BALSA
½" SQUARES
½ OF WINDSHIELD TEMPLATE
½ SIZE
BOTTOM
THE "WESTERNER"
DESIGNED & BUILT BY ELBERT J. WEATHERS SAN DIEGO-CALIFORNIA-U.S.A.
SCALE- 3/16" = 1" EXCEPT UNITS NOTED
WING SPAN - 8 FT.
ASPECT-RATIO OF WING - 9 TO 1
WING LOADING - 7.6 LB. / D'
WING AREA - 967 SQ. IN.
OVERALL LENGTH - 58 1/2 IN.
FLYING WEIGHT - INCLUDING CAMERA - 5 LBS. 2 OZ.
ASSEMBLY DRAWING-PLATE 1


PLUG WIRE HOLE
NOSE FORMER
1/8" SHT. N-1 BALSA
GROUND WIRE HOLE
TIMER WIRE HOLE
FIREWALL IS HARD 5/16" SHEET BALSA
FIREWALL IS SAME OUTLINE - INCLUDE SAME HOLES PLUS OPENINGS FOR WOODEN BEAMS
CEMENT HERE
4"
FRONT SPAR - 1/2 SIZE WING CENTER SECTION
12"
ALL SPARS ARE VERY HARD BALSA
REAR SPAR - 1/2 SIZE
2"
1 3/4"
REAR SIDE STRUT
FRONT SIDE STRUT
LANDING GEAR FRAMES 1/2 SIZE
USE HIGH GRADE 1/8 DIA. PIANO WIRE
7 1/2"
6 3/4"
CENTER SHOCK STRUT
7 3/8"
5 FT. LENGTH OF WIRE REQUIRED FOR L.G.
2 1/16"
5"
5 1/2"
DRAW TEMPLATES - CUT FRAMES TO LENGTH
BEND EACH IN VISE - USING HAMMER
PLATE 3
FULL SIZE
except above section
FULL WING RIB
MAKE 6 OF 3/16" SHT. BALSA
MAKE 12 OF 1/16" SHT. BALSA
FULL FALSE RIB
MAKE 17 OF 1/16" SHT. BALSA
HOLE FOR DOWEL
HOLE FOR TUBING
LEAVE BOTTOM FLAT ON TWO 3/16" RIBS
E.J.W.

Win FREE

COAST-TO-COAST AIRPLANE FLIGHTS TO HOLLYWOOD AND RETURN

Via American Airlines Flagship

JO KOTULA

by writing a 200 to 300 word essay on the question:

WHAT DO YOU THINK OF THE AIRPLANE AS A MEANS OF NATIONAL DEFENSE?

ALL AIR-MINDED AMERICANS CAN ENTER THIS

National Essay Contest SPONSORED JOINTLY BY

MODEL AIRPLANE NEWS and Metro-Goldwyn-Mayer

IN CONJUNCTION WITH THE FEATURE PICTURE

STARRING

TEST PILOT

CLARK GABLE

MYRNA LOY

SPENCER TRACY

WITH **LIONEL BARRYMORE**

EXTRA AWARDS

CLARK GABLE will personally present winners with exact replicas of the aviator suit worn by him in this picture!

THE RULES ARE SIMPLE

1. Anyone can enter except Model Airplane News and Metro-Goldwyn-Mayer employees.

2. There is no entry fee. Send, or take, your essay to your local theatre manager, school, club, Model Airplane News, 551 Fifth Avenue, N.Y.C. or M.G.M., 1540 Broadway, N.Y.C.

3. The contest is open now and closes September 1st, 1938.

4. Essays will be judged for originality and neatness. The decisions of the judges (names to be announced later) will be final.

WATCH FOR FURTHER ANNOUNCEMENTS REGARDING THIS CONTEST IN THE NEXT ISSUE OF MODEL AIRPLANE NEWS OR AT YOUR LOCAL THEATRE SHOWING "TEST PILOT"

National Aeronautic Association Junior Membership News

Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

THE 1938 "NATIONALS"

Detroit, America's fourth city, host to the 11th National Airplane Championship Meet, awaits you!

Nearly 1000 contestants to be, are feverishly building and testing indoor and outdoor rubber powered models, gas models and radio controlled models in preparation for the most looked forward to and most important model competition in the world, to be held July 6 to 9.

Sponsored by the Exchange Club of Detroit, and sanctioned by the National Aeronautic Association, this meet is expected to draw more model builders than ever to Detroit, the city whose generous support and cooperation had brought the National Meet there repeatedly.

The Detroit Exchange Club, whose most active committee is headed by Squire (Howell) Enrich, has been busy for several months raising funds, and making the necessary local arrangement.

Irwin S. Polk, as Contest Business Manager, has been working for many weeks contacting possible donors of prizes and handling the thousand and one details that will help make the contest a success.

The actual competition will again be under the direct supervision of H. M. Jellsion, who represents the Academy of Model Aeronautics. Assisting him, as Field Manager, will be Art Vhay, and his able staff from the Detroit Department of Recreation. Officers from Selfridge Field, and more of them than ever before, will act as timers, while members of the Academy will supervise the weighing and checking of the models before each flight.

Fort Shelby Hotel will be Contest Headquarters, where work room provisions and meeting facilities will be available to enable contestants to make last minute repairs, and to hold conferences.

The four day meet will be jammed full of contests, meetings, banquets, visits to the World's greatest industrial centers, Ford's Greenfield Village, theater parties, festivities, etc.

Competition for the traditional model aviation trophies and the numerous silver cups and gold medals will be more keen than ever. Records which seem unbeatable will probably fall in each event.

Model builders who intend to participate should start making their plans now.

Bob McRaney and gas model entered in the Birmingham, Ala., meet.

First: Send a stamped, self-addressed envelope with your request for the detailed rules, application and parents consent to Contest Committee, National Aeronautic Association, Dupont Circle, Washington, D. C.

Second: Build your plane according to the rules as to area, cross section and weight.

Third: Fill out your application and mail it in to Contest Headquarters, just as soon as you have reached a definite decision as to the events you intend to participate in.

The events, pending the approval of the Academy will be as follows:

Indoor Events

STICK MODELS—Class B and C.
CABIN MODELS—Class B and C.

Outdoor Events

WAKEFIELD INTERNATIONAL ELIMINATION EVENT: 200 inches main wing area. Weighing not less than 8 oz. with a fuselage cross section of not less than $L^2/100$ ("L"—over-all length).

STICK MODELS—Wing area, 100 to 300 sq. in., having a fuselage cross section of less than $L^2/200$, and weighing 3 oz. for every 100 square inches of main wing area. (Any type of power except gas engines)

CABIN EVENT: Models having wing area of 100 to 200 square inches weighing 3 ounces for every 100 square inches. Meeting N.A.A. fuselage cross section rule. Any type of power except gas engine permitted. The first six winners of this event will be the American Team for the Moffett International Competition.

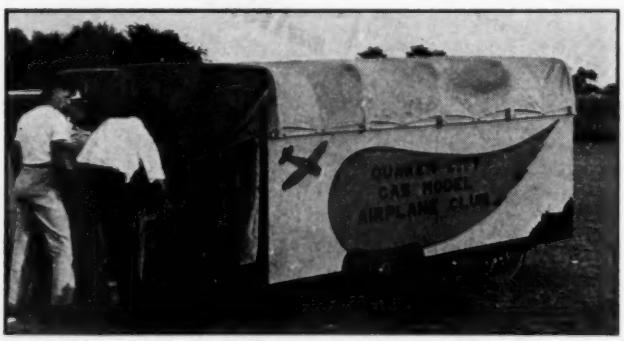
OUTDOOR FLYING SCALE MODEL EVENT: Rules to be announced next month.

GAS MODEL EVENT: Gas models with main wing loading of not less than 10 oz. per square foot of wing area, with 30 second engine run. National Aeronautic Association fuselage rule.

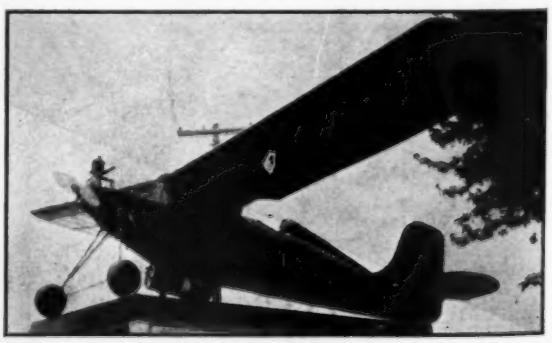
RADIO CONTROLLED GAS MODEL EVENT: Models to weigh not more than 25 pounds.

There is a possibility that a tow line glider event might be included, should the results of an Academy poll reveal that this event is desired by model builders.

There is an organized model club in your community, be sure to have your club director contact the nearest Ex-



Philadelphia gas model fans carry their planes in this trailer to all contests. Mr. Berry, 73, takes an active part.



This plane carries a dry cell which weighs 1¼ lbs. underneath the fuselage, and it flies.

Lew Barringer, president of the Soaring Society of America, at the controls of his sailplane.

Bob McRaney, WSON announcer, at left, describes the winners of the trophies shown in the foreground after the indoor contest at the Municipal Auditorium, Jan. 9th.

change Club. Many Exchange Clubs are cooperating with the National Exchange office in promoting model aviation, and many of the Exchange Clubs are interested in sponsoring local elimination contests, and possibly sending the winner to Detroit to represent their community. If there is no organized model activity, but you feel that sufficient interest can be created to successfully conduct a contest, by all means make an attempt to cooperate with the Exchange Club and organize such a contest.

NATIONAL CHAMPIONSHIP MEET

Insignia Contest

In order to obtain a suitable insignia to be used in connection with the 1938 National Championship Model Airplane Meet, a drawing competition has been announced. All model builders or aviation enthusiasts who are artistically inclined are invited to submit their ideas for a suitable design.

The insignia must provide a place for the emblem of the National Exchange Club and the N.A.A. wings shown here. *These trade marked emblems may not be changed in any way,* except that they may be proportionately enlarged or made somewhat smaller. Neither official emblem can touch any other part of the suggested insignia, although both emblems should be symbolic of youth aviation education through the hobby of model building. It may consist of one or more figures building or flying model airplanes or any other figure or groups which would portray youth aviation education as fostered by the National Aeronautic Association and supported this year by the Exchange Clubs. The original suggestion must be submitted drawn in India ink on stiff white paper. The best insignia as selected by a committee of prominent judges will be used in connection with this year's National Meet. The insignia will be for use on windshield stickers, badges, etc.

A contestant may submit as many suggestions as he desires. The contest is open to anyone, and the best insignia will be published here.

Send your suggested insignia to Irwin S. Polk Meet Manager, 421 Seventh Ave., New York City.

All Entries must be in by May 21, 1938.

Age Limit a Conference Topic

N.A.A. Headquarters has been deluged with vigorous objections to the age ruling in the sixth paragraph of the gas model license application and pledge: "I hereby certify that I meet the official age qualifications for gas model flyers (16 years of age or over) and that I will not permit any person who is not licensed as a gas model flyer to fly gas models owned by me."

The majority of the letters state that there are a great many gas model builders and flyers who are under the age of 16, but who are capable of looking out for their craft. The boys are desirous of becoming members of the Gas Model Division of the N.A.A., and of flying their ships under its regulations. Most of the letters carry the suggestion that the age limit be lowered, and that the flying of gas models by builders under 16 be supervised by N.A.A. Contest Directors or other responsible persons.

The First National Model Aircraft Conference and Academy of Model Aeronautics Meeting, was held at Washington, D. C., March 12 and 13. The nation's leading model aircraft authorities were present as well as a great many interested and influential persons. At this conference, the question of age limits for builders and flyers of gas models were discussed thoroughly, and a solution was reached that we hope will be satisfactory to all concerned.

TIPS FOR MEET OFFICIALS

Harry C. Copeland of Syracuse has made up the following cautions for meet officials of Exchange Club sponsored contests in New York State:

Officials shall count number of strands and record same on centre of wing before each flight.

Do not require a contestant to launch his model upon signal, but let him launch when he chooses within the allotted five minutes.

Do not ask an entrant to wind his rubber motor before it is clearly evident that the timers will be ready without delay.

Give all entrants every possible chance within the rules, but see that all observe the rules equally.

Be sure you are thoroughly familiar

(Continued on page 54)

Fill in the coupon below for membership in the N.A.A.

Use this coupon for either model membership application or for requesting NAA Gas Division application.

NATIONAL AERONAUTIC ASSOCIATION OF U. S. A.
Dupont Circle, Washington, D. C.

☐ I enclose fifty cents for annual NAA Model membership dues (use cash, check or money order) and hereby make application for Model membership in the National Aeronautic Association (age limit 21 years). There (is—is not) an NAA Model Chapter near me.

☐ Please send me the license application and pledge of the Gas Model Division of the Junior NAA (no age limit), which I must sign to become a member of the Gas Division. There (is—is not) a Gas Chapter near me.

☐ Please send me information on how to form an NAA Model Chapter and a Chapter charter application form. I enclose 10c in stamps.

Name .....
(Please print or type)

Street .....

City ..... State .....

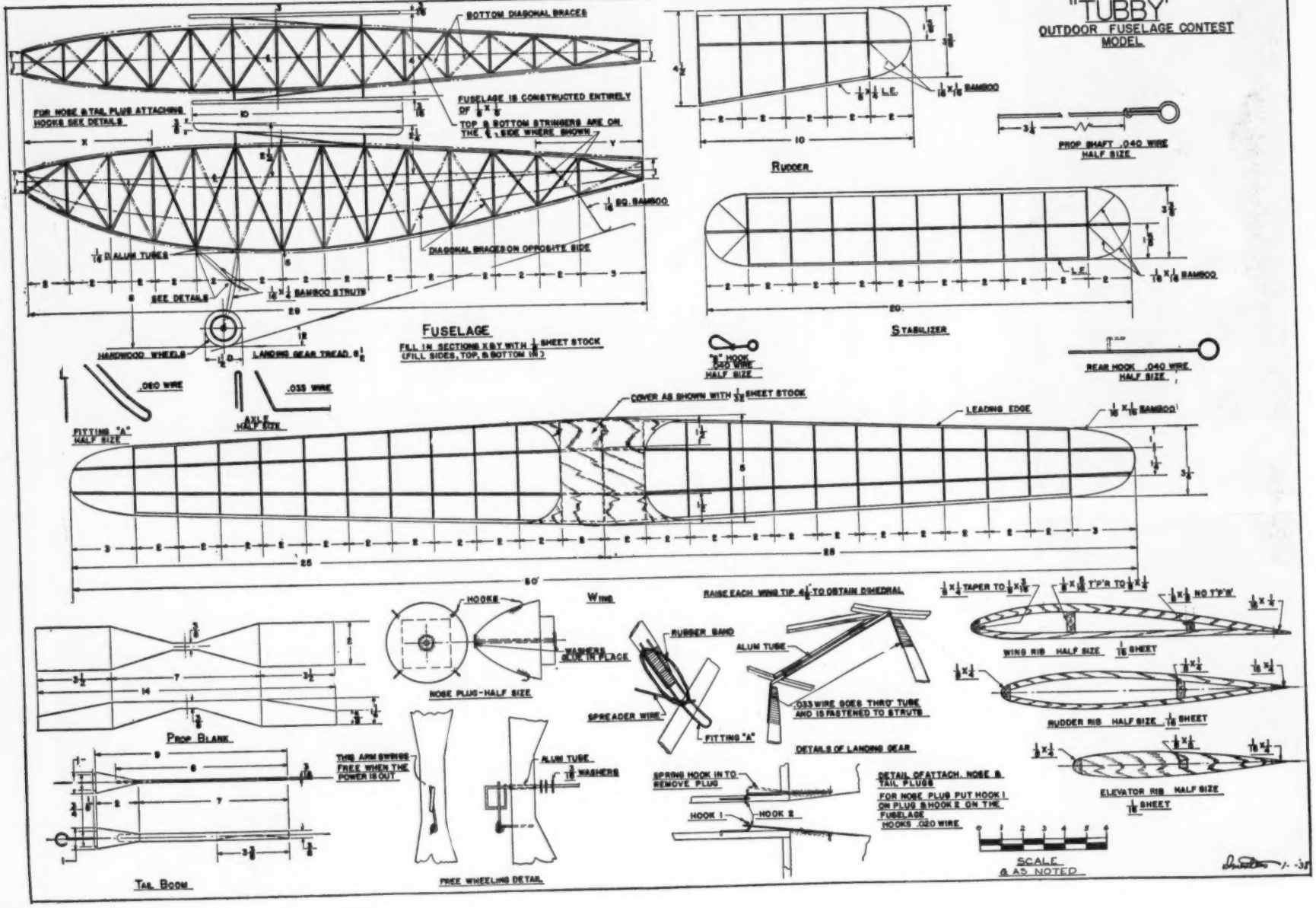
Date of Birth.....
(Month, Day, Year)

Membership application approved*.....

*(If membership application is being made and applicant is under eighteen, have parent sign here.)

"TUBBY"

OUTDOOR FUSELAGE CONTEST MODEL


BOTTOM DIAGONAL BRACES
FUSELAGE IS CONSTRUCTED ENTIRELY OF 1/8 X 1/8
TOP & BOTTOM STRINGERS ARE ON THE SIDE WHERE SHOWN
FOR NOSE & TAIL PLUG ATTACHING HOOKS SEE DETAILS
1/16 SQ. BAMBOO
1/16 D ALUM TUBE
DIAGONAL BRACES ON OPPOSITE SIDE
1/16 X 1/4 BAMBOO STRUTS
SEE DETAILS
FUSELAGE
FILL IN SECTIONS X & Y WITH 1/32 SHEET STOCK (FILL SIDES, TOP, & BOTTOM IN)
HARDWOOD WHEELS
LANDING GEAR TREAD
.060 WIRE
.033 WIRE
FITTING "A" HALF SIZE
AXLE HALF SIZE
RUDDER
1/16 X 1/4 L.E.
1/16 X 1/16 BAMBOO
PROP SHAFT .040 WIRE HALF SIZE
STABILIZER
L.E.
1/16 X 1/16 BAMBOO
"S" HOOK .040 WIRE HALF SIZE
REAR HOOK .040 WIRE HALF SIZE
COVER AS SHOWN WITH 1/32 SHEET STOCK
LEADING EDGE
1/16 X 1/16 BAMBOO
WING
RAISE EACH WING TIP 4" TO OBTAIN DIHEDRAL
1/8 X 1/4 TAPER TO 1/8 X 1/16
1/8 X 1/8 T.E. TAPER TO 1/8 X 1/16
1/8 X 1/8 NO T.E.
1/16 X 1/4
WING RIB HALF SIZE 1/16 SHEET
1/8 X 1/4
1/8 X 1/4
1/16 X 1/4
RUDDER RIB HALF SIZE 1/16 SHEET
1/8 X 1/4
1/8 X 1/4
1/16 X 1/4
ELEVATOR RIB HALF SIZE 1/16 SHEET
HOOKS
NOSE PLUG-HALF SIZE
WASHERS GLUE IN PLACE
PROP BLANK
RUBBER BAND
ALUM TUBE
SPREADER WIRE
FITTING "A"
.033 WIRE GOES THRO' TUBE AND IS FASTENED TO STRUTS
DETAILS OF LANDING GEAR
THIS ARM SWINGS FREE WHEN THE POWER IS OUT
TAIL BOOM
ALUM TUBE
1/16 WASHERS
FREE WHEELING DETAIL
SPRING HOOK IN TO REMOVE PLUG
HOOK 1
HOOK 2
DETAIL OF ATTACH. NOSE & TAIL PLUGS
FOR NOSE PLUG PUT HOOK 1 ON PLUG & HOOK 2 ON THE FUSELAGE
HOOKS .020 WIRE
SCALE
0 1 2 3 4 5 6
& AS NOTED

"Tubby"

A High Performance "Wakefield" Contest Model of New N.A.A. Specifications That Is Easy to Build From These Plans

By DONALD MERTENS

The completed model with its unique but efficient propeller.

"TUBBY," as I have nicknamed this model, due to its unusual appearance, is a high performance contest model meeting all of the newest N.A.A. specifications. It is a direct development of a model sent to England to compete in the 1935 Wakefield International Contest. Unfortunately the model was smashed before it could make any official flights and was not repaired in time to compete.

Tubby was designed to present a high performance model for the novice, that has performance equal to the best. It was with this thought in mind that this article was written. If the plans are followed closely you will have a model that will consistently place you among the winners of any contest that you enter.

Now we shall get on with the construction of the model. First you will want a set of full size drawings from which to make the wing and other components. A word about the plans. I believe that you will find every little item shown in a precise self-explanatory manner, so instructions will be kept to a minimum.

Fuselage

Lay the 1/8 sq. stringers in place on the side view. Put the uprights and diagonal members in place, glue securely. It is best to make both sides of the fuselage at the same time so that they will be exactly alike. Start joining the two fuselage sides at the tail and work forward. After all the cross braces are in place, glue the diagonal truss members in place. Now attach the stringers to the main structure. When dry fill in the nose and tail sections with sheet stock as shown on the plans. Now glue the 1/16" dia. alum. tube for the landing gear in place on the fuselage; also add the hooks for fastening the nose and tail plug. Carve the nose and tail plugs from the size blocks given on the plan; the tail plug also incorporates the tail boom, which is installed as shown. Now sand the fuselage lightly and cover. A word about the covering, this should be done in small sections joining each section neatly. Now dope the fuselage with three coats of the dope given under the heading "doping." Attach the wing mounts as shown.

Wing and Wing Ribs

The type of rib used on this model fabricate together to form a stronger rib than the solid type and also saves weight. A full size rib is shown. Cut the upper and lower curves from 1/16" sheet. Make all the ribs the same; in order to obtain the right length rib for the tip and intermediate ribs, cut the extra amount from the trailing edge. This method of making ribs simplifies the construction of tapered wings.

Place the leading and trailing edges in place on a full size drawing, then glue the bottoms of the ribs in place. Glue the spars in their correct places. When these are dry, glue the tops of the ribs in place. Bend to shape and glue the bamboo tip in place. Now cover the sections shown with 1/64" sheet stock. Sand the completed wing and put away for covering later.

Tail Surfaces

Cut out the rudder ribs in the same manner as the wing ribs. The construction is the same as the wing.

The elevator is made in the same manner as conventional ones are.

Sand the tail surfaces lightly and lay aside for covering.

Covering

Start by covering the rudder; this should be covered in four pieces. One piece is used from the bottom rib to the tip rib and another piece for the tip.

The elevator is covered in the same manner as the rudder.

Cover the wing by starting at the center rib and using one piece to the tip rib and then a separate piece for the tip; do the same for the other side. The top and underside should be covered separately. The grain of the tissue should always run the long way of the structure to be covered.

Doping

A dope consisting of two parts of collodion to one part of acetone, mixed completely together, should be used. Give all parts two coats of this dope. The wooden parts should be given two coats of straight collodion over the dope. (Note: all wood parts should be doped after the assembly of the complete model.)

Landing Gear

Bend all the wire parts for the gear as shown. Put the wires through the alum-tubes on the fuselage. Cut the struts to size and shape. Glue the struts in place on the wires that are through the tubes on the fuselage. Glue the spreader wire in place on the rear struts and fit "A" onto the front struts. Put the axles on the rear struts, and give all the joints a second coat of glue. Slip the wheels onto the axles and then solder a washer in place on the end of the axle to keep the wheel from slipping off. Assemble the gear together as shown on detail 2; a 1/2" long rubber band is used for the shock absorber. The rear struts should slide backwards in the guides and then be pulled forward in place by the rubber bands. Each side of the gear works semi-independently of the other.

Assembly

Glue the rudder and elevator onto the tail boom; a bamboo brace is run from the boom to the third rib on the rudder. Similar braces are placed on each side of the elevator.

Carve two right hand propellers and join them as shown in detail 3.

Bend all wire parts not yet made and install in their respective places.

Fasten the wing onto the wing mounts with rubber bands as shown in detail 4.

Power

Twenty strands of 1/8" x 1/30" brown rubber 36" long should be used. Put an "S" hook on each end of the motor. Make sure that you have rubber tubing on these hooks to prevent the hook from cutting through the motor. The nose and tail plugs are held in place when the motor is slack by the hooks that are provided for that purpose, and not by the rubber motor.

Flying the Model

Put the motor in the fuselage and install the nose plug with the propeller on it, and the tail plug in place.

Give the model a trial glide where the grass is quite high; if it dives move the wing forward and if it stalls the wing should be moved aft. When the model has a steady glide, wind up the motor to about 100 turns for the test flight. Minor adjustments will have to be made to the wing setting as you increase the number of winds put in the motor until the maximum power is reached. Turning of the model is controlled by warping the rudder and giving the wings "wash in" and "wash out" at the tips. The motor can be wound to approximately 1800 turns. With full power the model will take off in about 3 feet and the length of the flight is governed only by the thermals that it encounters. This model is very sensitive to the slightest air current and a slight thermal will send it scooting up, so get ready for a long chase.

"Gas Lines"

Official Section of the National Aeronautic Association Gas Model Division

Formerly the I.G.M.A.A.

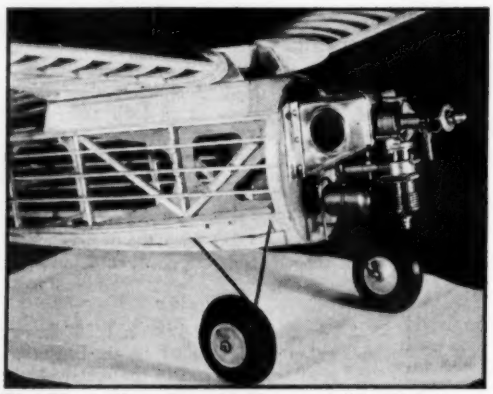
Pict. No. 1. A scale gas model Rearwin Speedster, built by H. Stafani.

FORMER I.G.M.A.A. members are still in the process of enrolling under the banner of the new National Aeronautic Association Gas Model Division. Applications for membership are coming in in increasing numbers, but as yet no check-up has been made on the exact number. However we will be able to give you this figure in the next issue.

This is being written on the eve of one of the largest model leaders' conferences that has ever been held. The whole problem of the new model organization will be discussed, and rules will be established that are based on the will of the majority of model builders throughout the country.

It is expected that leaders and prominent model builders from every section of the country will be present. Further news concerning the results of the conference will be found at the end of "Gas Lines".

Gas Model builders seem to be coming to life after a winter of hibernation in their workshops. There is increasing evidence that many new planes will make their appearance at the various contests to be held during the coming season. The progress made seems to be along the lines of refinement of appearance and streamlining. As yet no experimental ships have come to our attention in the field of helicopters. Several bat-wing ships have been built and flown. Details of one of these interesting ships will be given in the next issue.



Pict. No. 3. How the motor is mounted in H. J. Jewett's model. Note the plywood panel inside the body.

An unusual scale model Rearwin Speedster powered with a Gwinn inverted engine is shown in picture No. 1. Here the designer has shown how easily a miniature gas engine may be adapted to an exact scale model of a large plane. Also he has made an excellent choice of a model to build from a stability standpoint. The whole set-up aerodynamically of the Rearwin Speedster tends to produce a stable gas model. This ship was built by H. W. Stefani of 1034 49th Street, Sacramento, Calif. He tells us it is his first gas model and is colored silver with black trimmings. The weather has been so unsatisfactory that as yet it has been impossible to test the ship. If it flies as well as it looks Mr. Stefani should have no complaint.

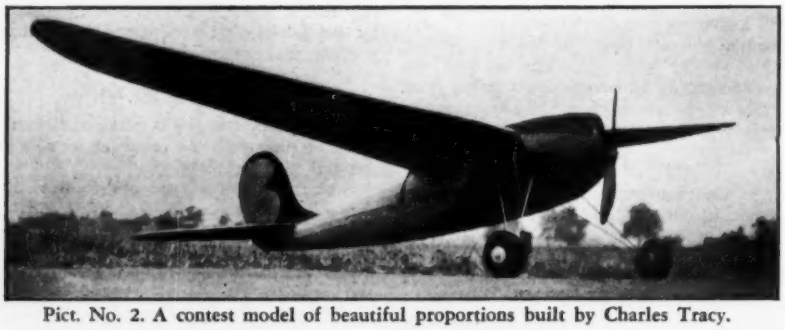
We hear from Mr. Charles Tracy, Junior Aviator Editor of "The Toledo News-Bee", Toledo, Ohio, leader of the former Toledo unit of I.G.M.A.A. members. He sends picture No. 2 of his latest gas job. He naively calls it "At Ease". We ponder over the significance of the name. We can readily understand that Mr. Tracy feels at ease after creating such a fine piece of work. Even a casual glance shows that it is beautifully designed aerodynamically. This should be a very efficient model. We wish to compliment Mr. Tracy on his conception of how a well designed gas job should appear. The wing span is eight feet and it weighs 6¾ pounds. The wing area is 7¾ square feet. Mr. Tracy says:

"After considerable trouble with the center of lateral area we have succeeded in making six flights with it."

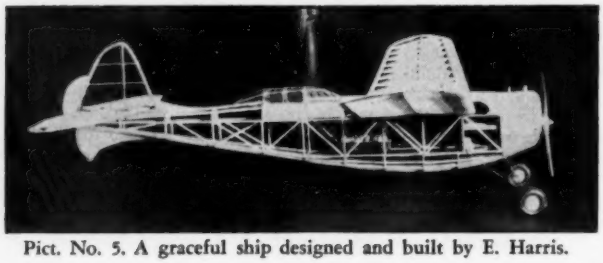
Readers will be interested in checking the performance of this ship on the chart shown on page 17 of this issue. The point on the chart which represents this ship is the intersection of the line from 6¾ pounds vertically upward and the line from 7¾ square feet running to the right. We find immediately that the plane is loaded fourteen ounces per square foot. This is exceedingly heavy. The chart shows the performance will be seventy-five feet of climb per minute. In other words, the performance is very low in respect to climb but unquestionably the model is very stable. Mr. Tracy writes further:

"A very unique landing gear shock-absorber is used. It consists of a strut made in two pieces, each having an eye on the end and then one slipped over the other. A spring is soldered between them. The strut compresses under pressure and spring snapping it back into original length.

"We raised the center of gravity after reading Mr. Grant's articles in the Jan-

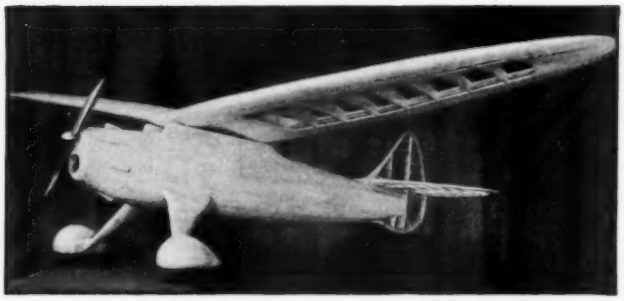


Pict. No. 2. A contest model of beautiful proportions built by Charles Tracy.



Pict. No. 5. A graceful ship designed and built by E. Harris.

Pict. No. 6. An unusual twin rudder job by Gus Slezak.



Pict. No. 7. Bill Effinger's new plane, with planked fuselage and cantilever landing gear. The C.G. and C.L.A. are in correct position.

Pict. No. 8. Capt. Bowden's world record hydro gas model. It has a wing span of eight feet. Note the large dihedral.

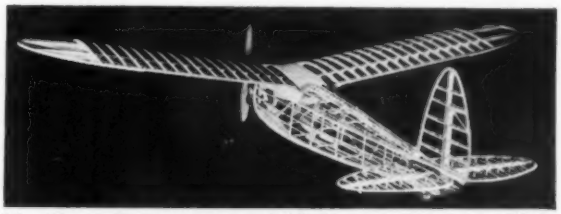
uary issue and I believe it solved our problems somewhat."

Mr. Henry J. Jewett of 3933 Imperial Highway, Lennox, California, sends us pictures No. 3 and No. 4. He tells us that he works at the Douglas Aircraft factory. This probably is a good explanation for the very fine piece of workmanship on the gas model which is shown in the pictures.

These pictures show clearly how the motor is mounted on the front bulkheads. The unusual part about the structure of the ship is that the whole front portion is re-enforced by vertical panels of veneer inside the fuselage. They may be clearly seen. These take up and diffuse the stresses originated from the engine, landing gear and wheels to all parts of the framework. The danger in building any structure is the concentration of stresses at any one point. We will be interested to hear how Mr. Jewett's model performs.

In picture No. 5 we see Ernest W. Harris' latest gas model. This is the second one he has built and it has a span of seventy-two inches with an average chord of ten inches. The wing area is five square feet. The airfoil section is a Grant X and is powered with a 1/6 horsepower Baby Cyclone gas engine. In order to make it easy to transport, the wing is built in two sections. The elevator is removable. There is an all-balsa cowling which may be removed so that the engine may be easily inspected and adjusted. Harris lives at Armstrong, B. C., Canada.

A very unusual design in gas models is shown in picture No. 6. The plane was built by Gus Slezak of New York City. Mr. John Targos of 232 East 74th Street, New York City, has been kind enough to send the picture and tell us something about the model. It has a wing span of six feet and is powered with a Brown Junior motor. Two flights have been made with the ship. It has a characteristic which makes it turn sharply after flying a short distance, and this peculiarity has caused minor crack-ups. This is probably due to improper adjustment, inasmuch as the design is such that the plane should be quite stable. We will be pleased if Mr. Targos will write us more concerning the future performances of this ship.



Pict. No. 4. H. J. Jewett's model before covering was applied.

Pict. No. 12. Ken Willard's new low wing racer.

Bill Effinger of 230 Steuben Street, Brooklyn, New York, has been designing ships again. His latest product is shown in picture No. 7. By a close examination readers may note that it conforms closely to recommendations made in the series of articles on gas model design which have appeared each month in MODEL AIRPLANE NEWS. It is beautifully constructed and on the whole the ship should be a very unusual flier. As yet it has not been test flown but we will predict very excellent performances. It has a wing span of 8½ feet. The tail unit is entirely removable. The model shown in the picture was built by Joseph Raspante of 547 Atlantic Avenue, Brooklyn, New York.

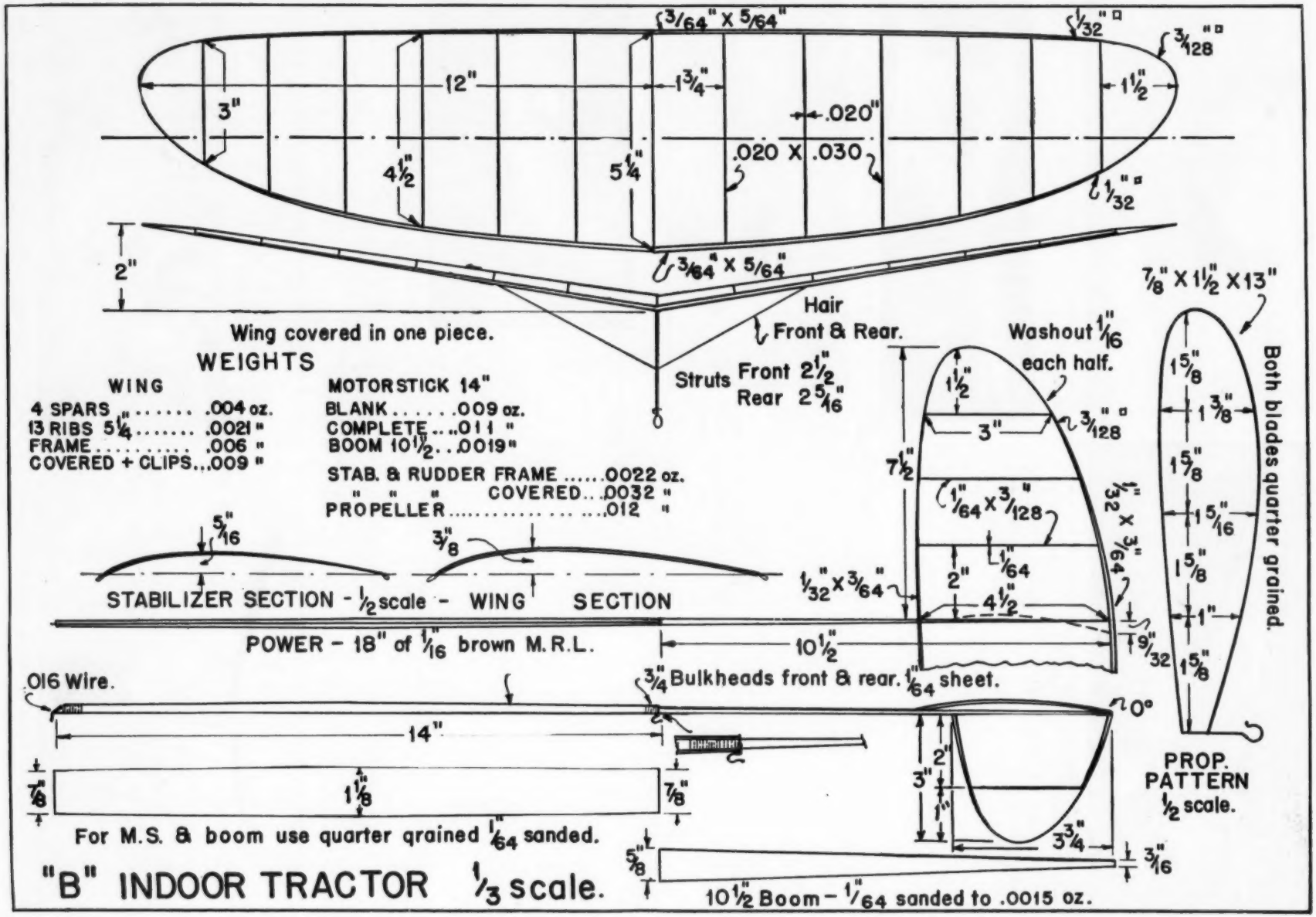
Pict. No. 11. This ship was made from junk by H. Stiglmeier, and it flew.

America gas model builders have not gone in for the creation of hydros to any large extent. Picture No. 8 therefore is very interesting. It shows Captain C. E. Bowden's record holder flying boat in full flight. Capt. Bowden lives at Bush Steep, Porlock, Somerset, England. This

(Continued on page 36)

Pict. No. 9. Mr. J. R. Forster and his modified Forster powered KG which has won three out of four contests.

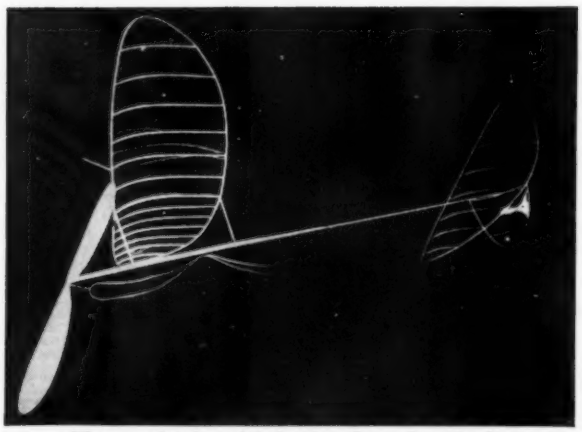
Pict. No. 10. A view of the "stalls" at the Chicago, Ill., contest. This system allows spectators full view of the planes.


3/64" X 5/64"
1/32" □
3/128" □
12"
1¾"
1½"
3"
.020"
.020 X .030
4½"
5¼"
1/32" □
2"
3/64" X 5/64"
Wing covered in one piece.
Hair
Front & Rear.
Struts Front 2½"
Rear 2 5/16"
WEIGHTS
WING
4 SPARS ..... .004 oz.
13 RIBS 5¼ ..... .0021 "
FRAME ..... .006 "
COVERED + CLIPS ...009 "
MOTORSTICK 14"
BLANK ..... .009 oz.
COMPLETE ...011 "
BOOM 10½ ..0019"
STAB. & RUDDER FRAME .....0022 oz.
" " " COVERED ..0032 "
PROPELLER ..... .012 "
5/16"
3/8"
STABILIZER SECTION - ½ scale - WING SECTION
POWER - 18" of 1/16" brown M.R.L.
Washout 1/16"
each half.
7½"
1½"
3"
3/128" □
1/64" X 3/128"
1/64"
2"
4½"
1/32" X 3/64"
1/32" X 3/64"
10½"
9/32"
7/8" X 1½" X 13"
Both blades quarter grained.
15/8"
1 3/8"
15/8"
1 5/16"
15/8"
1"
15/8"
PROP.
PATTERN
½ scale.
.016 Wire.
3/4" Bulkheads front & rear. 1/64" sheet.
0°
14"
7/8"
1 1/8"
7/8"
For M.S. & boom use quarter grained 1/64" sanded.
2"
3"
1"
3¾"
5/8"
3/16"
10½" Boom - 1/64" sanded to .0015 oz.
"B" INDOOR TRACTOR 1/3 scale.

A Low "Aspect" Indoor Tractor

How You Can Build a High Performance Indoor Ship That Appears to Defy Established Aerodynamic Principles

By CHARLES BELSKY



The completed model that has flown for 16 min.

OBSERVATION at most any indoor meet will disclose the fact that the low aspect ratio is rapidly gaining considerable prestige. The author believes that the advantages of the above mentioned type of model distinctly eclipses the so-called disadvantages. Obviously, the foremost advantage is the weight reduction maintaining the necessary structural rigidity. The weight saved overshadows, by far, the loss of efficiency, if any.

The drawing is of a plane used by the author at the Mississippi Valley Contest this year. It is a very conservative design reflecting the changing trend. The mentioned model, on an unofficial flight, flew for 19' 40". An unfortunate accident prevented an official flight of more than 16' 11". On this particular official flight the motor contained less than 1800 turns. It has a capacity of approximately 2800.

Later this design was equipped with a solid motor stick and with weights and strength increased to take the additional weight of such a motor stick. This model repeatedly flew over 16 minutes. After one particular flight, a time of 16' 13" was recorded. The plane was sent aloft with 1700 turns.

Construction

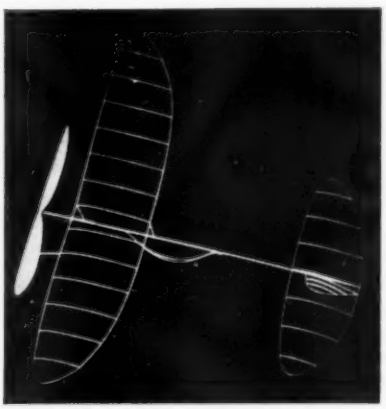
Wing: (spars)

The spars are of quarter-grained 1/16" sheetwood cut from 5 lb. cu. ft. bulk. Cut 11" long tapering from 3/64" to 1/32" sq. The spars are then cut to 5/64" tapering to 1/32". Sand the spars to an oval section. The four spars should weigh .004 oz.

Ribs

The ribs are cut from quarter-grained wood. 1/32" sanded to .020" or about 3/128". Use a metal or cardboard template to slice ribs with.

The spars are then soaked in warm water for a few minutes and pinned to the plan (full size) and let dry. The soaking of the spars serves two purposes. First, it allows them to hold their shape upon drying. Second, it causes them to expand and assume a larger cross-section adding to the rigidity. The ribs are attached to the spars using as little cement as possible. For correct size hoop for film, use two wire clothes hangers bound together to form one hoop. The wing is then covered as one unit, on this hoop. After covering, the wing is taken off with a hot wire, by trimming around spars. Dihedral is then cracked in and cemented. Loose film can be tightened by heat treating with a hot wire. The clips are then cemented to the wing and your mother's or girl friend's hair can be used to brace the wing, unless the builder himself has long hair. (But, this I doubt from past experience.) The braces are first attached to the spars and then to the clips. Do not tighten braces; they must be slightly slack else they will warp the wing.



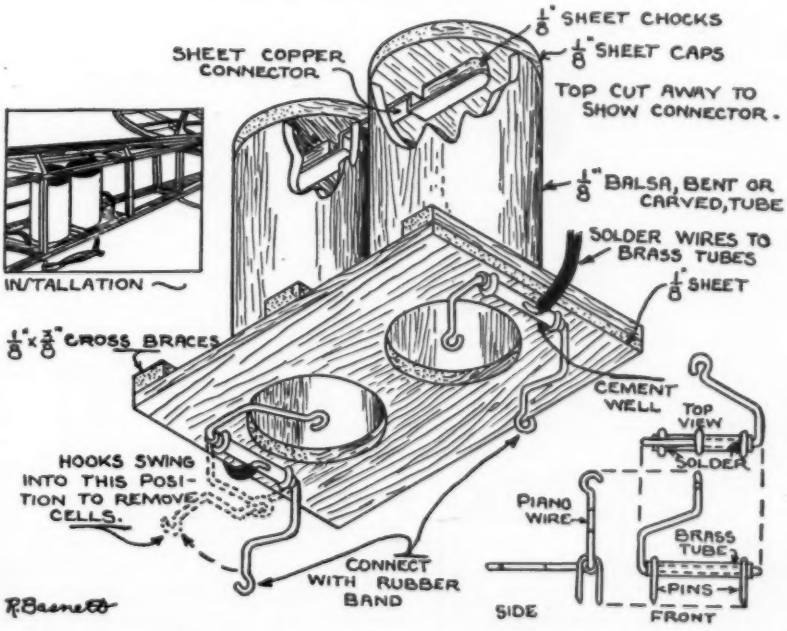
Note the short stubby wings.

Motorstick

A quarter-grained blank of 1/64" is sanded to the weight of .009 oz. It is then soaked in fairly hot water for a few minutes. Then bent around a solid former, and either gauze or white tissue or something or other, is wound around to hold shape. Be careful to note whether the seam is straight. Use less than .001 oz. of cement to fasten longitudinal seam. 1/64" sheet is cut ¾" long. For reinforcement, 2 of these are used in the ends of the stick. The stick is then capped with 1/64" sheet. Finally, the wire parts are cemented on. If the stick is not true then it may be trued by holding over heat, and held to desired shape. Total weight of stick is .011 oz. Use only quarter-grained wood for motor stick and boom. It is more difficult to form, but additional patience will be rewarded by a lighter and stronger stick.

(Continued on page 44)

Battery Box For Gas Models



■ The 3/16 scale, 7/8" C-D gage model railroad popularity is now so great we have decided this month to allot these two pages showing all the model railroad kits and items we now manufacture so that the whole family might enjoy some of the pioneering spirit that goes into the start of building a railroad—any railroad, model or full sized.

C-D MODEL RAILROADING IS FOR THE WHOLE FAMILY

Yes, these fascinating C-D home town railways are springing up in every part of the country and in so very many cases every member of the family enjoys a part in making it up—mother, dad, sister and brother alike, for one enjoys the building of locomotives, the other likes work in the "car shop," another likes the making and setting about the various little human figures, automobiles, trucks, etc., while still others like the scenery, landscaping, the building of the small cardboard houses, signs, etc. Yes, building it up is fun for the whole family, but still greater fun operating the finished model trains, and it shouldn't be passed up wherever it may be encouraged in the slightest.

For these family model railroads, the C-D size is the best size—large enough to embody all the detail desired yet, small enough to permit the building of an entire system in one room. And if price is of any consideration whatever, you'll realize that the total size of building C-D equipment is only a fraction of other gage railroads—thus enabling a much greater layout and far more rolling stock.

4 Sectional Kits Available $4.50 Ea.

C. G. W. 4-6-0 MIXED TRAFFIC LOCO

$16.95

(13 5/8" o.a. Absolutely complete kit in every respect.)

A.C. or D.C. operated at the same price. Insulated for 2 rail systems.

THE MOST POPULAR OF SMALL GAGES

So instantaneously popular have been these C-D gage kits, both locomotives and cars, that today there are more pieces of this gage rolling stock already built than all other gages under the 0 gage ¼" scale size put together—this is the reason for our announcing the fact that the "C-D's have revolutionized model railroading". In fact more C-D systems are under construction today than in "0" gage, heretofore the most popular of all model railroads (not "toy trains").

"REPS" BLAZED THE TRAIL—NEW FANS STARTED

The "Representative" type equipment, which first made its appearance on May 25, 1937, started a revolutionary new spirit in the model railroad world starting in thousands of newcomers by making it possible for the average model railroad builder, or the young boy with just a few pennies in his pocket, to build model railroad equipment, both cars and locomotives alike. They were advertised from the outset as being "Representative" material only—and not to be compared with the Operating type which we planned on introducing later.

C. & O. Locoand P. R. R. Caboose "Reps" mentioned above.

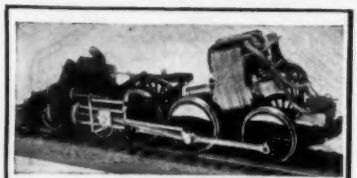
C-D SUPER OPERATING EQUIPMENT

So when our Operating locomotives were announced, many "old timers" believed they would see a slightly modified repetition of the former all-wood "Representative" models. BUT after they had the opportunity of inspecting this Operating equipment, they were very, VERY delightfully surprised. They are simply amazed at the beautiful and fine detailed die castings supplied to scale—yet made for precision operating equipment.

Such features as the new assembled drive wheels split at the rims for two-rail operation (at least three counter balances for wheels supplied, to be easily inserted separately)—the highly detailed main and side rods—the accurate valve gear parts, cylinder block—and numerous other die cast parts were far more than they expected at the amazingly low prices put on this equipment. The reverse switch kit has pleased so many "dyed in the wool" model railroaders that they are now using this as standard equipment for all their future locomotive work.

As for the beautiful detail on the loco superstructure, they admit it would be impossible to make a better looking boiler, cab and details of metal than from the materials we supply, properly finished. And the same applies to the tender, to which embossed sides are cemented **giving exact scale reproduction of every rivet seen on the prototype!**

Those who think our operating equipment is "just another all-wood locomotive" are due for the surprise of their lives. Just order one—or a section, and see for yourself! Four sections to each—the 0-6-0 at **$4.00** each, the 4-6-0 at **$4.50** each, postfree.



This illustration of the C-D Operating C. G. W. Mechanism could not possibly do justice to the quality of C-D all metal mechanisms, now being supplied with either A.C. or D.C. motors at the same price. The beautiful die cast detail MUST be seen to be appreciated—all easily assembled.

AND MORE COMING SOON!

We are now busily engaged in designing other types of Operating equipment—locomotives, passenger cars, reefers, boxes and other type freight cars as well as everything needed for right-of-way equipment offering at first (as C-D may always be expected to do), the most necessary items to be followed later with those less important.

BUT WITHOUT YOUR ASSISTANCE WE CAN ACCOMPLISH LITTLE

So, modelbuilders, even with this brand new C-D gage to the 3/16" scale (exact gage of 7/8") we can accomplish very little unless we have your support, both in the way of purchases, and also for suggestions as to what you would like to see us produce right along.

TRY A FEW TODAY

Therefore, before another day has elapsed, you should send your order and remittance for at least a few of the cars alone to see how simple it is to build up a model railroad car. A simple car sub-structure is made of balsa wood parts, which simply needs the addition of the proper lithographed coverings to be applied, to give you the detail much better than may be seen in all the photographs shown on this page, and the cost is so surprisingly low. Even though you decide never to make any additional cars or locomotives, just keeping these few as "ornaments" you couldn't go wrong. In fact, we'll guarantee it!—And you'll keep adding to your system.

Read What Others are Saying

"The C-D Gage is the best gage that ever came on the Model Railroad Market."

"This will be the first time I ever attempted to build a system because the price of other engines and cars and supplies made me whistle, and how!"

"I do believe you have developed the best average man scale, and have done more for the fellows who have heretofore wanted to but could not afford to build model railroads than all the other model companies put together. Cleveland Model & Supply Co. is a pal to all the heavy hearted 'used-to-stand-by-and-watchemers'."

READ BEFORE ORDERING: All direct orders subject to our regular ship... either with or without Kits, a $.15 packing, postage and handling charge ... given, then postage according to your zone must be included for this or we ... ments. To U. S. Possessions, Canada and British Isles, add 10% extra; all ... to include 10c for No. 3 Catalog if you don't have a copy.

DEALERS: Write at once for biggest sales opportunity on ... Kits

Cleveland Model ... S

4508-B36 Lorain Ave. ★ *"Model Engin... since*

C-D GAG...

AUTHENTIC TR...

Sample Kit—This kit co... and curved roadbed, rail, ... axles, bushings, wood ... parts may be used as ... **postpaid** .....

Special C-D Gage Scale ... section has been specially ... may be used for HO as ... rail on O gage. Size .1... .045" head width. The ... steel rail and is very easy ... 3 ft. lengths only. Per ... (Postage extra. Shipping ... 2¾ lbs., figure smaller ...

Rail Connectors, brass, ...

Steel Spikes—0/32" long, ... 1000 .....

Ties—Stained, 3/64"x⅛"x... wood. 1000 ties will ... track according to ...

Ties—Stained, 3/64"x⅛"x... (plenty for any switch) ...

Track Gage, die cast, ... curves. Each .....

NEW ! THIS ! MONTH

C-D Straight Roadbed ... composition board are ... have the correct ballast ... making double track ... side by side giving the ... distance to which ties are ... complete the desired ... ping weight ½ lb. per ... **length** .....

C-D Curved Roadbed ... radii and larger turnouts ... slotted roadbed section ... which is cut to the ... bed section. Simply ... any "easement" curve ... strike in passing and ... and most inexpensive ... curved scale tracks. ... ties. (Shipping weight ... **each 3 ft. length** .....

C-D Roadbed for One ... with ballast slope on ... for each one ordered ...

C-D Roadbed for No. ... long with straight ballast ... ballast slope of correct ... for righthand and left ... which one is desired ... weight ¾ lb.).

C-D Ballast, suitable ... lbs. will cover approx. ...

5 lbs. (shipping weight ...

Fine Green Fired Sand ...

Coarse Green Fired Sand ...

Fine Red Fired Sand ...

Coarse Red Fired Sand ...

NOTE: When applying ... transparent glue, the ... shaker may be used ... until dry, then shake ... bed wipe off the top ... of tin before it dries.

Transparent Ballast ... ties and ballast to ... and green sand to ... ties and ballast to ...

Per pint (shipping ...

Per Qt. (shipping ...

C-D GAG... PACK

You save 10% on ... Layout now included ... and 48" ...

No. 1—24 ft. Track ... C-D gage tinned ... ties and 1000 steel ... **Special kit price** .....

No. 2—48 ft. Track ... C-D gage tinned ... ties and 2000 steel ... **Special kit price** .....

(Following ...

No. 3—24 ft. Track ... the following ... bed, ½ pt. ballast ... (Shipping weight ...

No. 3A—24 ft. Track ... curved roadbed ... 10 lbs.) .....

No. 3B—24 ft. Track ...

RAIL OPERATING R. R. PARTS

MATERIAL

...ngles of our straight ...ies, ballast, wheels, ...ed die castings. All ...Special kit price.....50

...ese brass running rail ...ed by Cleveland. It ...00 gage and for 3rd ...94" width of base, ...is a good imitation ... Comes in straight ...100.....$2.50

...ds for 100 ft. of rail ...weights from this.) ...100 $1.00.

...s, head .045"x.075". ...25

...ed, non-splitting soft ...ed to 30 ft. of single ...ar 20x.1000..... .75

...ew switches, 7 pcs. .85

...ually widens track on ...25

Wide Switch Layouts

SIZE—Authentic ...ngements. Includes ...complete crossovers ...ed left, a double or ...ee crossover. All ...may be used for ...four each left and ...R. 6 switches), a ...ble switch and ...ossings, 30 degrees, ...ves, 60 degrees and ...ches. All economi- ...ake up of C-D rail- ...dings needed! Com- ...on one large sheet ...instructions, post- ...only 8 .25. One ...ree with each ...of C-D track kit.

...Roadbed ...ard are ...ct ballast ...track or ...iving th ...ich ties ...esired ...eadbed ...r turnou ...section ...to the ...Simply ...curve ...ng and ...xpensiv ...acks, ...weigh ...gth ...for Cu ...ope on ...ordered ...for Nu ...ght bal ...of curv ...and ...desired ...) ...suitable ...approx. ...ng weig ...Fired ...Sand ...Fired Sa ...applied ...use, the ...e used ...shake t ...the top ...dried ...allast ...st to ...d to ...st to ...ping w ...ding wi

...Straight sections of ...2 7/16" wide, and ...on both sides. When ...ections, they are laid ...10 ft. center to center ...and rail are added to ...real scale track. (Ship- ...weight.) Per each 3 ft. .15

...For curved section 24" ...covers, etc., employ this ...same composition board ...as the straight road- ...the radius desired or ...but no cars would not ...on. This is the simplest ...of making realistic ...seen when covered with ...per 3 ft. length.) Per ...21" long, 4¾" wide ...gles. Shipping weight ...Each.....20

...Turnout—11½" ...on one side and curved ...on the other. Made ...turnouts' please state ...ding. Each (shipping .15

...axles 3/16" or less, 5 ...single track. Approx. .75

...5 lbs.....75

...t. 5 lbs.....75

...5 lbs.....75

...t. 5 lbs.....75

...st, coat surface with ...ble ballast on (a salt ...if desired) and leave ...surplus, but on road- ...with the edge of a piece

...waterproof) for gluing ...Also used to glue red ...One pint will glue ...50 ft. of single track. .40

...75

TRACK KITS

...by buying kits. Switch ...' and 45° kit, ...sists of 48 ft. of new ...rail joiners, 1250 wood ...Shipping weight 2 lbs.) 2.75

...Consists of 96 ft. of new ...50 rail joiners. 2500 ...Shipping weight 4 lbs.) 4.75

...Detail Track Kits)

...same as No. 1 but with ...24 ft. straight road- ...ties, 2½ lbs. ballast, ...special kit price.....4.45

...same as No. 3 but with ...weight. (Shipping weight 4.85

...same as No. 3 but with 12 ft. of straight and 12 ft. curved roadbed. (Shipping weight 10 lbs.).....4.65

No. 4—48 ft. Track Kit—Same as No. 2 but with 48 ft. of straight roadbed, 1 pt. of ballast glue and 5 lbs. of ballast. (Shipping weight 19 lbs.) **Special kit price**.....7.95

No 4A—48 ft. Track Kit—Same as No. 4 but with curved roadbed instead of straight. (Shipping weight 19 lbs.).....8.55

No. 4B—48 ft. Track Kit—Same as No. 4 but with 24 ft. of straight and 24 ft. of curved roadbed. (Shipping weight 19 lbs.).....8.25

No. 5—18" Super-Detail Track Kit—For displaying models of "Rep" or Operating locos or freight cars until you have your layout made. Kit consists of straight roadbed, rail, ties, spikes, ballast and ballast glue. **Complete kit** (shipping weight 1 lb.).....50

ROLLING STOCK PARTS

SRL-1 Drawing for P. R. R. 0-6-0 Switcher.....1.00
SRL-3 Drawing for C. G. W. 4-6-0 (Ten-Wheeler).....1.00

Drive Wheels, R80C. Beautifully detailed die castings, 56" dia. 13 spokes (for 0-6-0) with tires, insulation and four different counter-weights (any wgt. may easily be attached to wheel). **Per wheel** (not per pair).....25

Drive Wheels, R60C. Like above, 72" dia. 17 spokes (for 4-6-0) with tires, insulation and 3 counterweights, also **per wheel**.....25

Replacement Tires. Die cast, No. R81 for 56" or No. R 87 for 72" wheel, **each**.....10

Special Fibre Insulation Sheets, for insulating drive wheels, etc., 2 pieces, 2¾", one each of .005, .005 and .007 thick for.....10
Above kits make up one complete pair of insulated C-D Gage trucks with detailed die cast side frames and wheels, very easy to assemble. Suitable for either "Super" kits or "Rep" car conversions.

Uninsulated 33" Wheels, R-66, with small holes to be mounted directly on axles, **per pair**.....10

Insulated 33" Freight Wheels, R-67. Are also used as locomotive leading wheels 33" dia. Wheels with large holes for insulating bushings, **pair**.....10

Freight and Passenger Car Axles, R-72. Also used on locomotive leading and trailing wheel axles (when using for leading wheel axles, trim axles flush with face surface of wheel). ⅝" dia., 1 5/16" total length with shoulders. **2 for**.....15

The whole family can enjoy the fun of making up scenes like this.

Dalman Freight Truck Kit as listed below, **pair**.... .65
Andrews Tender Truck Kit as listed below, **pair**.. .65
Fibre Wheel Bushing, R-70, for freight and passenger wheels, also locomotive leading and trailing wheels, 3/16" o. dia., shoulder .121 dia., total length 11/64, **2 for**.....10
Locomotive Axles, R-73, 3/16" dia. shouldered and already quartered to precisely fit our die cast drive wheels, **each**.....10
Couplers, R-65. Well detailed die cast, **pair**.....15
Air Brake Cylinder, R-97, die cast for freight cars, **2 for**.....10
Standard Brake Wheel, R-94, die cast, **2 for**.....10
Ajax Brake Wheel, R-95-96. With housing, die cast.....10
Side Rod Screws, R-16. Steel, shouldered and slotted, threaded 0-80, **per pair**.....15
Main Rod Screws, R-17. Steel, shouldered with hex head. Threaded 0-80. **Per pair**.....15
Turned Wood Loco Generator, R-14, 3 for.....10
Turned Wood Headlight, R-10, 3 for.....10
Turned Wood Tender Air Brake Cylinder, R-56, 3 for.....10
Complete Set of Wood Turnings Only for 0-6-0 or 4-6-0; consists of boiler, all domes and stacks, generator, lights, air tanks, etc. **Each**.....70
Tender Body cut to shape of wood for 0-6-0 or 4-6-0, **ea.**.....20
Reverse Switch Kit—Body size ⅝"x11/16"x9/32" high, all parts cut to shape, insulating block drilled and tapped, etc., only assembling is required. **Complete** kit with assembly and wiring instructions.....65
Brass Worm, 48 pitch, hard, single thread, ¼" hole, ⅝" total length with set screw, **each**.....35
Bakelite Worm Gear—With brass hub and set screws, 3/16" bore, ⅜" face angular cut, with 30 or 35 teeth—to be used with above worm to give 30 to 1, or 35 to 1 ratio reduction, either size, **each**.....30
The following items have all scale rivets embossed in their proper location as well as all numbers and names. These sheets, when applied, will make a real beauty of your locomotive.
Pair of Tender Sides for either P. R. R. 0-6-0 or C. G. W. 4-6-0, **per pair**.....75
Set of Embossed Covers for boiler front, smoke box, fire box and cab for either P. R. R. 0-6-0 or C. G. W. 4-6-0, **per set** for either one.....50
Brass Channel—for 3/16" scale or free lance locomotive main frames of your own design, size 3/64"x⅜"x⅜"x9" long, **each**.....35
Brass Hand Rail Posts, R-71—May be used for scale models ¾" and under; head is 1/16" dia. drilled with a .028 dia. hole for hand rails, stem .040" dia. (press in No. 60 drill hole). Total length 5/16". **Each**.....04

ROUND BRASS ROD—for hand rails, pipes, etc
Hand Rails—No. 24, .022" dia. x 1 ft. long, spring brass. 5 ft. for.....05
Small Piping—No. 31, .032" x 1 ft. long, soft brass. 4 ft.....05
Large Piping—No. 19, .040" dia. x 1 ft. long, soft brass. 3 ft. for.....05
Square Brass Rod—1/16" for crosshead guides, etc. **Per ft. .03; per 100 ft.** in 3 ft. lengths (shipping weight 2 lbs.).....1.25
Sheet Brass—.015"x2"x4" for small parts, **each**.....05
Brass Bell, R-57—¼" dia. x ¼" long, **each**.....10
Tender Draw Bar, R-58—Stamped of brass, **each**.....05
Motor Mount, R-22—Brass, for A.C. or D.C. motors (when using D.C. motor, bend back end over). Complete with all screws.....25
Fine Brass Rivet Pins—for valve gear parts, **approx. 75 for**.....10
Permanent Magnet Motor—For 6 volts D.C. 1" high, 1⅛" wide and 2¾" long, shaft is ⅛" dia. and extends 1¼" which means the motor with shaft is 3⅛" long. Commutator is 3 segment type, armature is ¾" dia. and ⅝" wide. This motor does not require a reverse switch because the motor is reversed by changing the positive wire with the negative, thus remote control is very easy. This motor should be run on D.C. or batteries only and should not be used on alternating current unless rectifier is used to change the A.C. to D.C. **Each**.....$3.50
C-D Special Electric Motor—Medium duty for 10 to 12 volts A.C. or D.C., 1¼" wide, 1⅝" high, 1⅞" long. Shaft ⅛" dia. and extends ¾", a reverse switch should be used with this motor to be operated by hand, (not by remote control.) **Each**.....$3.50

SPECIAL BRASS PARTS
For SRL-1 and SRL-3 But May Also Be used on Free Lance Models.

Valve Gear Hanger, R-37, for P. R. R. 0-6-0, **each** .35
Link Hangers, R-36, to be used with the frame above by riveting or soldering, **per pair**.....15
Valve Gear Hanger, R-60, for C. G. W. 4-6-0, **each** .35
Valve Gear Frame, R-38, for C. G. W. 4-6-0, **each** .35
Eccentric Crank, R-34, for either model, **pair**.....10
Eccentric Rod, R-32, for C. G. W. 4-6-0, **pair**.....10
Eccentric Rod, R-33, for P. R. R. 0-6-0, **pair**.....10
Combination Lever, R-30, for either model, **pair**.. .10
Radius Rod, R-31, for either model, **pair**.....10
Reverse Lift or Crosshead Rods, R-29, for either model, **pair**.....10
Reverse Shaft Levers, R-35, for 0-6-0, **pair**.....15

SPECIAL DIE CAST PARTS
For SRL-1 and SRL-3 But May Also Be Used on Free Lance Models.

Side Rods, R-42, for P. R. R. 0-6-0, **per pair**.... .35
Main Rods, R-43, for P. R. R. 0-6-0, **per pair**.... .20
Side Rods, R-40, for C. G. W. 4-6-0, **per pair**.... .40
Main Rods, R-41, for C. G. W. 4-6-0, **per pair**.... .20
Reverse Link, R-39 LR, for either model, **per pair**.. .15
Crossheads, R-20 LR, for either model with piston rod and crosshead link cast integral. Milled to fit crosshead guides, **per pair**.....45
Lead Truck, R-54, C. G. W. 4-6-0, die cast with axle holes, **each**.....25
Main Frames, die cast, with axle holes bored, No. R-61 for P. R. R. 0-6-0 switcher.....1.25
or No. R-64 for C. G. W. 4-6-0.....1.35
Cylinder Block, R-74, P. R. R. 0-6-0, die cast.... 1.25
Cylinder Block, R-75, C. G. W. 4-6-0, die cast.... 1.25

LIQUIDS FOR MODEL RAILROADERS

Metal Primer for Zinc Base Die Castings—To use, just paint on with a small brush but be careful not to coat bearing surfaces; when dry it will give the castings a dark gray color and a very, very fine sandpaper-like surface. Almost any kind of paint or lacquer will adhere to this surface without peeling off. Just try it once and you'll be well pleased.
½ oz. bottle (more than enough for a loco.).....10
Specially prepared Model Railroad Lacquer—The lacquers listed below are suitable for use with the present C-D model railroad material. In 4 colors—R. R. Black, Battleship Gray, R. R. Red, Bright Orange.
1 oz.....10 2 oz.....18
"Steel-Grip" Cement—So called because it has, literally speaking, a steel grip on any two objects cemented together. We can guarantee this waterproof cement to hold almost anything together except rubber and plastic materials.
1 oz. .12 2 oz. .20 1 pt. 1.25
Wood Cement—This waterproof colorless cement is used for all model railways, airplanes and boats, as well as other work in general, where a quick drying glue is needed. Sets in 20 minutes but takes longer if a thick clot is used.
1 oz.....10 ½ pt.....(8 oz.) .55
2 oz.....18 1 pt.....(16 oz.) .95

For full details on these locos see our 1938 catalog!

★

1938 Catalog Only 10c
Contains present C-D Railroad information—tracks, kits, ties, spikes, operating trucks, couplers, etc.—BUT don't let this delay the possibility of not getting started—SEND YOUR ORDER TODAY!

★

P. R. R. Switching Locomotive

Kit Only $14.95

12¾" O.A. (ABSOLUTELY COMPLETE) Elec. Operating Kit. SRL-1

Four PRR Sectional Kits Available 4.00 Ea. For A.C. or D.C. Operation at the Same Price. Insulated for 2 Rail Systems.

★ Watch for C-D's Superior Rolling Stock! ★

C-D REP KITS

These Kits Are Complete—Except Contain NO Liquids

All to 3/16" scale for ⅞" gage. Average over all sizes — Locomotives, 12" - 17"; Passenger Cars, 15"; Box Cars, 8"; height 2½". Kits are complete with sides, tops and ends printed in authentic colors and lettering. By simply employing working couplers, detaching dummy trucks and replacing with actual working trucks, all "Rep" (cars only) models may be used in your operating layout.

RL-1 PRR Switcher 0-6-0 .65
RL-2 C&O Pacific (4-6-2) .85
RS-1 Hiawatha (4-4-2)..... .95
RS-2 Hiawatha Tap-Diner .75
RS-3 Hiawatha Coach..... .75
RS-4 Hia. Beaver Tail.... .75

BOX CARS
RB-1 NYC—40 ft. steel.... .45
RB-2 B&O—40 ft. steel.... .45
RB-3 B&O—40 ft. wood.... .45
RB-4 Rock Island 40' wood. .45
RB-5 Wabash—40' wood.... .45
RB-6 SP 40' wood furn..... .45
RB-7 T&P 40' wood auto.. .45
RB-9 AT&SF—40' wood.... .45
RB-11 Union Pac—50' st'l .55
RB-12 AT&SF 50' st. auto .55

CABOOSE
RC-1 PRR type N-5..... .45

FLAT CARS
RF-1 C&NW 46' 50 ton.... .25
RF-2 PRR 46' 50 ton..... .25
RF-3 B&M 46' 55 ton..... .25
RF-4 L&N 46' 50 ton..... .25

GONDOLA TYPE CARS
RG-1 L&N 41' 50 ton.... .35
RG-2 NYC 41' 50 ton..... .35
RG-3 MC 41' 55 ton..... .35
RG-4 T&P 41' 50 ton..... .35
RG-5 PRR 65' 70 ton mill type gondola..... .35

55 T. TWIN HOPPER CARS
RH-1 CCC&St L RR..... .40
RH-2 Missouri Pac. RR.... .40
RH-3 Southern Railroad.. .40
RH-4 Illinois Central RR.. .40

8000 GAL. TANK CARS
RT-1 Texaco—TCX (wh.) .35
RT-2 NATX (black)..... .35
RT-3 Sinclair8DRX (blk.) .35
RT-4 Gulf—CRCX (blk.) .35

Send check or M. O. (cash at own risk). No C.O.D.'s. When ordering parts, be included. No packing charge is made on Kits except if shipping weight is ...press charges collect. Ask your postmaster. We send credit cards for over pay- ...ries, 20%, except those which have a "transit charge," then add 40%. Be sure

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AIR WAYS

HERE AND THERE

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Tell Others What You Are Doing

Air Ways Club News

Pict. No. 1. Dick Korda's beautifully designed new Wakefield Model.

NOW that the weather provides us with an occasional touch of spring, model builders' thoughts are turning to the many competitions to be held this spring and summer. One of the most important ones is the international competition to be held in France for the Wakefield Cup. It is very difficult each year to get together a team of four or five model builders to cross the Atlantic bag and baggage in order to uphold honors for America. Finances appear to be the chief problem.

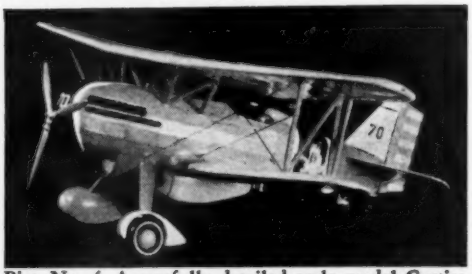
Nevertheless, this year there seems to be increasing interest in this competition, and it is expected that many of our expert model builders will put forth their effort to bring the Wakefield Cup back to America. MODEL AIRPLANE NEWS is getting behind this movement right now.

In this issue there appears plans for a Wakefield model, and in the coming issues plans for other unusual ships in this category will be presented.

It is fitting, therefore, that we start our Air Ways column this month with picture No. 1, which shows Dick Korda's Wakefield model, which weighs 8¼ ounces and has 208 square inches of wing area. As many readers recall, Korda is one of our foremost designers and builders who is a consistent winner. He lives at 1002 Sophia Avenue, Cleveland, Ohio. If looks have anything to do with performance this model should be a world beater. It is one of the cleanest and finest ships of this type we have seen. Complete rules and model specifications for the Wakefield contest appear further on in this column.

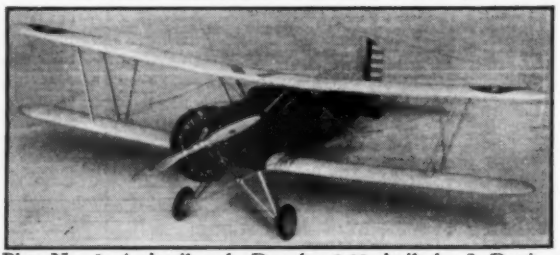
Picture No. 2 shows a detail scale Douglas 0-38, which has been built by J. Dettis of 54 Bellanca Avenue, Pittsburgh 10, Pa. This little plane is a remarkable piece of workmanship. It has been built to a half-inch scale. Like most fine scale models, all the controls work from the cockpit. The motor is entirely built up of balsa and cardboard discs. A photograph of this was shown in Air Ways a short while ago. Evidently the "gas bug" has bitten Mr. Dettis, for he wishes us to announce that he would like to trade this model for a gas model kit or a motor.

The boys of the Findlay Model Club, under the leadership of Mr. A. B. Fruchey of 448 Center Street, Findlay, Ohio, are just as busy as ever, perhaps more so. Whereas they are exceedingly interested in gas-powered planes and are spending a great deal of time on their developments, they have not overlooked the essential build up for gas models; that is, the creation of scale models. Picture No. 3 shows a solid scale Northrop Gamma which has been carefully modeled by Bob Jeffery, the speed plane champion. You see,

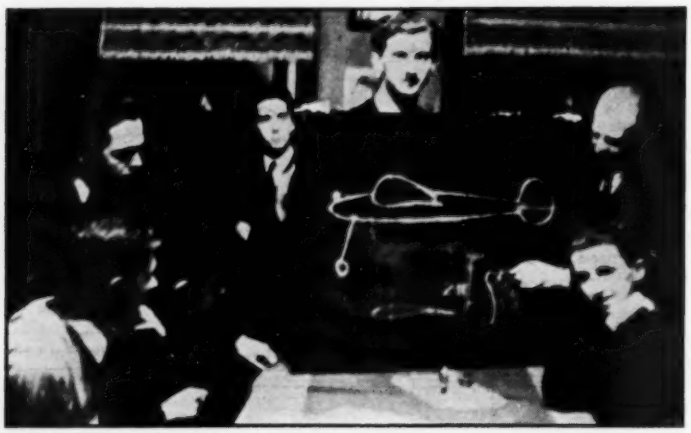


Pict. No. 4. A carefully detailed scale model Curtiss P6-E, built by Bob Crawford, of the Findlay Model Club.

Pict. No. 3. Bob Jeffery built this Northrop Gamma.



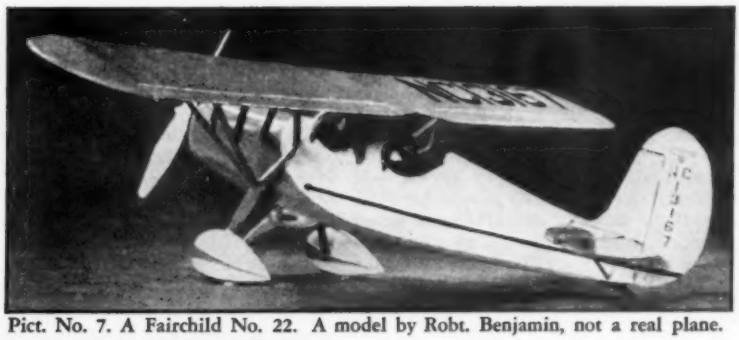
Pict. No. 2. A detail scale Douglas 0-38, built by J. Dettis. The fine workmanship is apparent even in the picture.



Pict. No. 12. A group of I.M.A.C. members discuss model problems.

Pict. No. 11. A new champion, Ralph Brown.

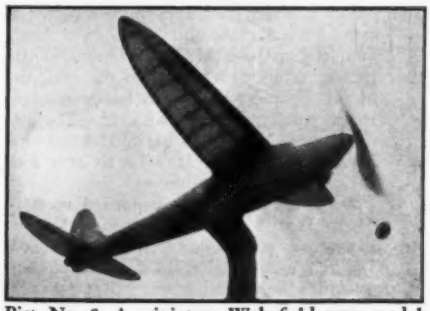
Pict. No. 8. Rex Hall's six foot sailplane.



Pict. No. 7. A Fairchild No. 22. A model by Robt. Benjamin, not a real plane.

Pict. No. 6. Just three scale models by LeRoy Erickson. The people shown on the wings are not Lilliputians. They were merely put on the picture by a trick of the photographer.

Pict. No. 13. Three fine models; a Hawker Hurricane, a Potez and a Hawker Nimrod, by G. E. Pearce, England.



Pict. No. 5. A miniature Wakefield type model of 30 in. wing span, by Leonard Oelman. It's a beautiful flier.

Pict. No. 9. Mr. Alexander and his "Flea."

Pict. No. 10. A line-up of speed models at a contest in Salt Lake City, Utah.

Bob is very versatile.

Picture No. 4 shows a Curtiss P6-E detail scale model which is the work of Bob Crawford. These two gentlemen seem to be very active and their names often appear together in the model field. We wonder if members of this club work in pairs. An appropriate name for them might be "The Heavenly Twins." No details are given concerning Crawford's scale model. However, the details in the picture tell the story in themselves.

Leonard Oelman of 29 New Jersey Avenue, Brooklyn, New York, has been kind enough to send us picture No. 5, which shows a thirty inch flying model that he designed and built last summer. It is similar in appearance to a Wakefield job, but has only about half the required area for such a ship; i.e., 107 square inches. The general specifications are: span, thirty inches; chord, five inches; wing section, modified RAF 32. A unique feature in the construction of this model is that 1/16" balsa ribs are hollowed out in the center so that all that is left are cap strips of 1/16" depth. The main spar is slotted to take these ribs. This method does away with about three-quarters of the wood in the rib and still provides an unbelievably strong wing. The wing is covered with tissue. The stabilizer has a span of fifteen inches and a two and a half inch average chord. The cross section is a lifting Clark Y. Each rib is made from 1/32" sheet, hollowed out in a manner similar to the wing ribs. The fuselage is twenty-seven inches long from nose plug to tail plug. The bulkheads are of three-ply 1/32" sheet balsa. These bulkheads are mounted on four stringers and the whole structure is covered with 1/32" sheet balsa, sanded down when finished to 1/64". The motor, which is two feet long, consists of from ten to fifteen strands of ⅛" rubber. A propeller of ten inches diameter with a fifteen inch pitch is used. Oelman says that the performance is remarkable.

It seems one of our readers, Mr. LeRoy Erickson of 6503 Leighton Avenue, Lincoln, Nebraska, has been doing a little "monkey business." It just goes to show what photographers can do to make you believe a picture is something that it isn't. Picture No. 6 illustrates our point. It shows several solid scale models built by Erickson. If you look closely you will not that a young man and woman are sitting leisurely on the right wing of the foremost model. Erickson has done a very good job here of deception. Perhaps he will explain how he accomplished the illusion. He says this is his first attempt at trick photography.

A very fine scale flying job appears in picture No. 7. It is a Fairchild "22," built by Robert Benjamin of 47 Hawthorne Avenue, Pittsfield, Mass. It has a sixteen inch span and required a month and a half to complete. The ship contains many fine details. By examining the picture closely you may see two dials on the panel of the front cockpit. Mr. Benjamin says that he is indebted to Howard Babbitt of 49 Oxford Street, Pittsfield, for the fine photograph he made of this ship.

Many readers are interested in carefully built sailplanes. Picture No. 8 shows one built by Rex Hall of 313 Ryan Street, Bellflower, Calif. This ship has stayed aloft for fifteen minutes with a tow-line of 150 feet. It weighs 4¼ ounces and has a wing spread of six feet.

Mr. David L. Alexander, Jr., of Aiken,

(Continued on page 60)

Gas Lines

(Continued from page 29)

ship was recently granted the British R.O.W. record for this class of gasoline powered models. The plane has a wing span of eight feet. Hydro builders should note that the front step is well forward, slightly in front of the leading edge of the wing. It is an important part in hydro design to have the water pressure on the hull, produced by the step, well forward so that the front end of the boat will be lifted clear of the water and will not "nose in".

Picture No. 9 shows Mr. J. R. Forster of 519 Lake Street, Maywood, Illinois, designer and builder of the famous Forster Brothers engines, with his Forster powered modified KG gas model. He has improved the looks of the ship by making the wing tips elyptical and building a cabin between the wing and the fuselage. This ship is credited with winning three out of four contests. In the fourth contest it flew out of sight into a cloud. The plane has an approximate climb of 600 feet a minute.

Picture No. 10 shows the activity in the "stalls" during a contest at the Harlem Airport, Chicago, Illinois. This is a typical contest scene and gives a good example of how the stalls should be laid out. The ship flying in the background is *not* a gas model, but a full size craft. Nevertheless it lends considerable realism to the picture.

Now we come to what is probably the most unusual gas model ever constructed. It has been built by Henry Stiglmeier of 5115 West 106th Street, Inglewood, Calif., and is shown in picture No. 11. We will let him tell you about it. He says:

"Believe it or not, this is a 'junk' model. Someone once remarked that I could make a barn door fly. The inspiration came from this idea, and also because I wanted to see how simple and cheaply I could make a gas model which would fly well. I spent one afternoon and four evenings constructing the model. The cost less power plant and timer was about twenty-five cents. Anyone could get the rest of the material for nothing. The wings are one-eighth three-ply packing box material. The fuselage is white pine; the landing gear and wing support are 3/8" 3-ply. Nails and screws are used to assemble the plane. Cement was used on the wing ribs and at the bottom of the landing gear supports only. The tail is covered with wrapping paper attached with flour and water paste and braced with string. The wooden tail wheel is supported by a sheet metal bracket. The wings are held on with red rubber bands and piano wire braced. The axle is piano wire and has 1" shock travel. The battery box is under the motor, which is a Brown Jr. No dope was used.

"The wing span is 64" and the plane weighs 7 lbs. It will R.O.G. from smooth ground under full power and climb slowly. It flies steadily and lands well. Only one prop has been broken so far. The wing loading is 24 ounces per square foot of wing area."

A very unusual and sleek looking racer is shown in picture No. 12. It was built by Ken Willard of 1734 Ridge Avenue, Evanston, Illinois. Old readers already know of Mr. Willard's unusual ability in designing fine models. About this model Ken says:

"The ship has a fifty inch span, weighs one and one-quarter pounds, and, as usual, is powered by an Elf. Performance calculations, based on Oswald's method (NACA TR 408) show excellent characteristics:

Maximum speed 35.5 mph.
Landing speed 13 mph (using C^1 of 1.00, since Max C^1 will probably not be reached).
Rate of climb at sea level 260 ft. min.
Speed for best rate of climb 22 mph.

"I shall of course fly the ship under usual conditions with the controls set for flight at 22 m.p.h. in order to obtain the maximum rate of climb. However, since the controls are adjustable, this can be varied for different flight results. I am in no great hurry to see it fly at maximum speed, because I don't think it important, and also because the damage resulting from a possible head-on collision would be much greater at that speed.

"The fuselage is all balsa with paper over it to prevent the dope from sinking in. The cabin top is hinged on one side to allow access to the engine accessories, and the motor cowl is split longitudinally, with each side hinged to swing out to the side so that the engine may be readily reached for any purpose. The engine is mounted on a dural frame which is bolted to the fire wall. All in all, it is one of the most accessible models, from the standpoint of the engine and accessories, that I have seen.

"The relation of the force components you have already heard; i.e., the CG and CLA in line, with the lift resultant acting slightly above the CG, which is unusual for a low wing. You probably will notice the dihedral in the tail, which I deemed useful since there is a lift component on the tail. I believe it will add materially to the stability, especially in gliding flight.

"Test flights for the ship are scheduled immediately after the Chicago show, as soon as weather will permit. The results should prove extremely interesting, and I'll let you know how they come out."

Mr. Per Weishaupt of Torkel Badens Vej 12, Hellerup, Denmark, tells us that interest is growing in gas models in his country. The gas model league in Denmark is called "Dansk Modelflyver Forbund", which has lately been joined by nine of the twenty-odd Danish model clubs. More are going to join soon. Mr. Weishaupt is president of this society.

Recently an American motor was imported from Switzerland by the father of a former member of the club in Odense. He lent the motor to Mr. Carl Rose, who built a model for it from plans in MODEL AIRPLANE NEWS. The ship climbed steeply and flew for several minutes on a very small amount of gas.

CLUB NEWS

New Jersey

Mr. Carl Frank of the Linden Model Airplane Club, writes us that they are on another flying spree. The club is sponsoring the state gas model meet of New Jersey, having had considerable success in their last year's Union County gas meet.

The meet will be held on June 25th, at 10:30 a.m. at Hadley Field. The sanction for the meet was received from the N.A.A. and entrants will be limited to 100. The entry fee is twenty-five cents and fifty cents at the field.

California

Mr. Elbert J. Weathers of 2720 Poinsettia Drive, San Diego, Calif., corresponding secretary of the San Diego Aeroneers, says that the third annual gas model meet of the Aeroneers will be held at the U.S. Navy Landing Field on Camp Kearney Mesa, San Diego, California, on April 24th, 1938.

Over 150 entries are expected from all over Southern California. First prize will be $50 in cash, followed by smaller cash awards and many merchandise items of interest to gas modellers.

While the San Diego Aeroneers are not the largest organization in California engaged in gas model activities, they enjoy the reputation of being one of the most active groups. All gas model builders in California are cordially invited to enter.

The type of contest to be held will be for 35 sec. engine run. Due to the excellent thermal conditions prevailing most of the time at Camp Kearney Mesa, where San Diego gas model flying is conducted, many long flights will probably be made on the short motor time allowed. Each model will be allowed one point for every second it remains in the air after the engine cut.

Washington

Mr. Richard D. Megorden, director of former I.G.M.A.A. unit No. 57, with headquarters at the Y.M.C.A., Yakima, Washington, sends us a report of the activities of this group, which is as busily engaged in gas model activities as ever. The date of the first Northwest gas model meet has been changed from May 1st to May 15th. Mr. Megorden continues:

"Full details of our proposed meet on May 15, will be sent you soon. We are expecting participants from Oregon, Idaho, Vancouver, B.C., Canada, and Washington. The meet will be a very colorful affair in that we are to have the Washington State National Guard Observation Squadrons as our guests. California will also be represented by none other than that great gas modeler, Mr. Irvin Ohlsson, and one of his assistants, Mr. Gordon Burton. These attractions along with many fine prizes will, I am sure, make a very fine meet."

New York

Mr. Magnus Andersen of 83 North Burgher Avenue, West New Brighton, New York, who is secretary of the Richmond Model Flying Club, announces that the annual gas model contest sponsored by this club will be held on August 14th at Miller Field, Staten Island, New York. All those desiring further information should write the Richmond Model Flying Club, 26 Bond Street, Staten Island, New York.

Pennsylvania

The Philadelphia Gas Model Associa-

(Continued on page 58)

NOW EVERY ONE CAN AFFORD

TO BUILD A HIGH QUALITY, FINE PERFORMING GAS MODEL AT A STARTLING LOW COST

THE STREAMLINER

Wing Span 6 ft., Weight (less motor) 2¼ lbs. Length 43"

Gas Model Builders from coast to coast are acclaiming this new gas model. Letters are being received by us from all parts of the country reporting many endurance flights and also saying how easily and quickly it was for them to construct the model. The Streamliner is really an advanced type of gas model and the kit for it is the most complete on the market today. Complete construction kit, Postpaid, or at your dealer..... **$4.95** Less motor and wheels

The same complete kit as described above, but including a pair of 3½" pneumatic rubber air wheels (value $1.50 pair.)..... **$5.95** Less motor POSTPAID

Here's a real value! In the past a combination motor and airplane at this price was unthinkable. Today you can purchase (either from your dealer or direct) the complete outfit including pneumatic rubber air wheels and the new Brown Jr. Model "D" engine, all for only..... **$15.95** Postpaid Complete

With the drastically low price of only $10.00 for the new Brown Jr. Model D engine (see Scientific's ad giving full information on this motor on page 47) every model builder can now get the peak in gas model performance and quality at a price well within his reach. What was formerly paid for the gas motor alone, will now pay for not only the motor, but the model kit as well! A Brown motor and a Scientific model, each the acme of performance in their sphere, can now be gotten for the former price of the Brown motor alone! Need we urge you to order your motor and your kit at once?

1 Hour 20 Min. GAS MODEL

THE WORLD FAMOUS RED ZEPHYR GAS MODEL

This Red Zephyr gas model now holds the championship of France with the record flight of one hour and twenty minutes. In addition to holding this championship, it has also won high honors in many American contests. A consistent flyer and the most complete and easy-to-build model ever offered at this low price. Kit complete, including finished gas model propeller, pair of pneumatic rubber air wheels, and all parts and materials, as well as full size plans. **$6.95** Postpaid less motor

The same complete kit as described above, but including the new Brown Jr. Model "D" engine. All for only **$16.95** Postpaid

AT YOUR DEALER OR POSTPAID

MISS AMERICA—7 ft.

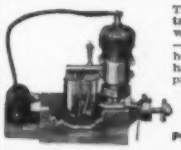
A reliable, consistent flyer which repeatedly comes in among the winners. Complete kit including 3½" pneumatic rubber wheels, finished 14" propeller and all other parts and Plans.

AT YOUR DEALER OR DIRECT **$9.50** Postpaid less motor

BUILD YOUR OWN MOTOR AND LEARN THE PRINCIPLES OF GAS MOTOR OPERATION

Mighty Midget up. kit	$ 9.85
Mighty Midget assembled	14.00
Mighty Midget inv. kit	10.10
Gwin Aero up. kit	11.35
Gwin Aero inv. kit	11.60
Warrior Assembled	12.00

THE NEW OHLSSON MOTOR WITH A TRANSPARENT FUEL TANK



This new fuel tank takes all the guesswork out of fueling—now you can see how much fuel you have. Many high precision features.

Complete motor with propeller. POSTPAID **$18.50**

FREE PROP, OIL and DOUBLE GUARANTEE WITH EVERY ENGINE

SCIENTIFIC GAS MODEL SUPPLIES ARE GUARANTEED SATISFACTORY OR MONEY REFUNDED!!!

IT'S HERE

BROWN JR. MODEL "D"

⅞" Bore, 1" stroke. 1200 to 10,000 R.P.M. ⅓ H.P. Bare weight 6½ oz. Height 4½". Complete with tank, coil, condenser, propeller. **$10.00** Postpaid Only

HURLEMANN SPARK PLUG

Comes apart for cleaning. Leakproof. Each.....75c

"MADE LIKE A WATCH"

LANDING GEAR BRACKETS

Complete set of 2 brackets and 6 set screws. Complete 50c

JACK and PLUG

Jacks, each.....10c
Plugs, each.....10c

GAS MODEL BALSA STRIP BALSA 5 ft. Lengths

⅛x⅛	.02
⅛x¼	.04
⅛x⅜	.06
⅛x½	.06
3/16 sq.	.04
3/16x½	.08
¼x¼	.06
¼x⅜	.08
¼x½	.10
¼x⅝	.10
¼x¾	.12
¼x1	.15

SHEET BALSA 5 ft. Lengths

1/32x2	.10
1/32x3	.15
1/16x2	.12
1/16x3	.18
⅛x2	.15
⅛x3	.20
3/16x2	.18
3/16x3	.25
¼x2	.20
¼x3	.25
½x3	.25
½x4	.35

CHAMPION SPARK PLUGS

Correctly designed for miniature gas engines. Made with the same precision as the regular Champion Plugs. Price each—only 65c

SCIENTIFIC PNEUMATIC WHEELS

These wheels are absolutely puncture-proof. Per pair $1.50

NEEDLE VALVE & BODY

For Brown Jr. "C" and "B", OHLSSON '37-'38, Mighty Midget, Gwin Aero, Warrior and Mighty Marine Engines.
Needle Valve.....50c
Body 50c

ZEPHYR SILK

Strong and light finest grade for models. Per sq. yd.....50c

SCIENTIFIC GAS MODEL FINISHES

The finish on a gas model does a great deal in making a successful model. Don't take chances with inferior low-priced finishes. Buy the best. Clear Nitrate Dope, Colored Nitrate Dope, Nitrate Thinner, Gas Model Cement, Regular Cement, Bamboo Paper Cement, Banana Oil.

3 oz. bottle	$ .25
½ pt. can	.50
1 pt. can	.75
1 qt. can	1.40

HOOK UP WIRE

Oil, gas and waterproof. 5 ft. coil 20c

TRU-PITCH GAS MODEL PROPS

Accurately carved with hole drilled. Made of clear hard wood in 13 and 14 in. sizes. Look for the name "SCIENTIFIC TRU-PITCH" stamped on every prop. Each.....99c

LAMINATED PROPS

Mahogany & Spruce; TRU-PITCH with hole drilled. 10, 11, 12, 13, and 14 in. Each $1.50

FILTER FUNNEL

New design—3 in. stem will reach any gas tank set deeply in fuselage. Special filter screen in funnel assures clean fuel. Each.....30c

VALVOLINE MOTOR OIL

Finest grade for use in miniature gas engines. Per bottle 20c

NEEDLE VALVES

For all Models of Cyclone Engines. Each 50c

M&M WHEELS

1½", 1¾", 1½" 15c—pair 50c
1¾", 1¾", 2¾" 21c", 2¾"—pair 60c
3½"—pair $2.75
4½"—pair 2.75
6"—pair 4.50

DO-NUT RUBBER TAIL WHEELS

1" diam. ea. 8c
1¼" diam. ea. 9c
1½" diam. ea. 10c

AERO PRECISION MOTOR

3⅜" high for 3 to 5½" foot models, turned head and streamlined exhaust pipe. ⅛ h.p. Special price $9.95 Postpaid.

REPLACE YOUR OLD COIL NOW WITH A

$2.50 Postpaid

You'll be surprised at the new pep and power your engine will have.

BIG-SHOT COIL

For large Models. Takes more volts. $3.50

for all motors. Special. Each....$1.95

HOW TO ORDER

Add 15c to orders up to $1.50. On orders over $1.50, add 10% of order. Orders amounting to $4.00 and over are sent postpaid. All SCIENTIFIC Kits and Gas Motors are sent postpaid. All orders shipped same day they are received.

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In France: E. Kruger & Co., 9 Rue St., Sebastien, Paris.
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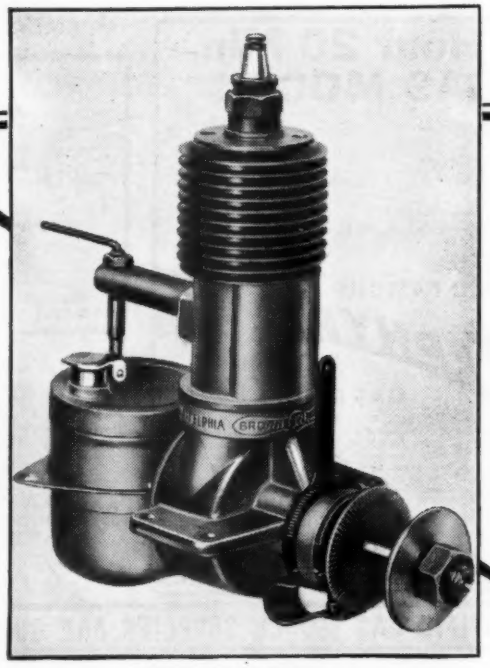
NOW... FOR ONLY $10

...get the thrill of flying the champion!



Brand new Brown Jr. Motor gives you top-flight performance at a new low price!

GAS model history is being made right now —with this new, powerful, low-priced Brown Junior Motor Model D. For a price less than you expect to pay for even an ordinary motor *kit*, you can now buy this champion power-plant *complete*—ready for the take-off!

What a value! If you're a veteran gas model-builder, this new motor will save you real money. If you have always wanted to fly a gas model, but have held back because of price—then here's your opportunity to step right up with the best of them at a new low in cost.

The Model D has everything that users have come to expect of Brown Junior Motors: power, speed, stamina and sound engineering advances. In every way, it lines up with the famous Brown motors that have won first places and flight records everywhere.

Here are the specifications on the Brown Model D. Bore, ⅞". Stroke, 1". Weight (bare) 6½ oz. 1/5 h.p. R.P.M. 1200 to 10,000. Height 4¾" (including spark plug). "Z" metal counter-balanced crank-shaft. Connecting rod of forged aluminum alloy.

Like all other Brown Junior Motors, Model D is block-tested before shipping and guaranteed against defective workmanship or materials.

Brown Junior Motor—
Model D—$10 complete

The addition of the low-priced Model D makes Brown Junior Motors unquestionably the greatest line-up of motors on the market. Every model flyer can find exactly what he wants in a Brown motor.

Model B. Users consider the Brown Model B the finest motor made for gas model flying. Specifica-

Brown JUNIOR

tions meet the same high standards as other Brown Motors, with the addition of a special crank-shaft of chrome molybdenum—the *toughest* metal known. This makes Model B practically shock-proof. Model B also has a special rust-proof, weather-proof finish.

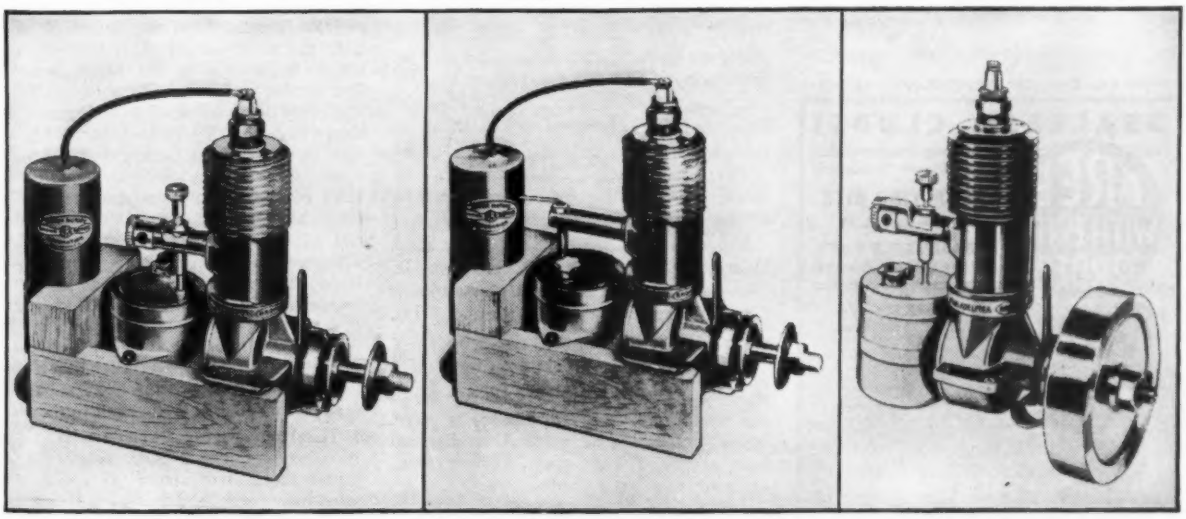
Model C offers the proven advantages of the Brown Junior Motor at a medium price. Of sound, sturdy construction, it combines light weight with speed and durability.

Model M (Marine) This model brings to marine motors the speed and stamina characteristic of Brown motors for model planes. This motor is light enough in weight for powering model boats, powerful enough to propel full-size canoes.

In planning gas models, it pays to look at the Brown line-up. With these remarkable motors, Brown offers the best service facilities in the model motor industry.

THE BROWN JUNIOR MOTORS NEW SPARK PLUG. New and improved design. You'll find this spark plug the best plug on the market for models. It is not an adaptation of the automobile type spark plug, but a special design for model motors. It gives you a concentrated spark for easy starting. Oil free. Leak-proof. 65c

THE BROWN JUNIOR MOTORS COIL provides full strength spark at low speeds for easy starting. It is water-proof, oil-proof, gas-proof. Specially designed and precision-built.



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Brown Junior Marine Motor—Model M — $15.00 complete

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Junior Motors Corporation
2545 N. Broad Street, Philadelphia, Pa.

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☐ Please send me the name and address of the distributor nearest to my home.

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1/8x1/4	.55
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1 sq.. 8 for	.25

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Per 20	
1/32 x 2	.15
1/16 x 2	.18
1/16 x 3	.36
3/32 x 2	.21
3/32 x 3	.42
1/8 x 2	.23
1/8 x 3	.46
1/4 x 2	.42
1/4 x 3	.84
1/2 x 2	.75
1/2 x 3	
10 for	.75

18" Planks

1 x 1½ each	.05
1 x 2 each	.08
1 x 3 each	.10
1 x 6 each	.18
2 x 2 each	.13
2 x 3 each	.18
2 x 4 each	.25
2 x 6 each	.30
3 x 6 each	.70

Balsa Prop. Blocks

Per Doz.	
1/4 x 3/4 x 5	.05
1/2 x 3/4 x 6	.06
5/8 x 1 x 7	.14
3/4 x 1 x 8	.18
3/4 x 1 1/4 x 10	.25
3/4 x 1 1/4 x 12	.30
1 x 1 1/4 x 15	.48

Balsa Nose Blocks

1"x2"x3" 6 for	.11
1"x3"x3" 6 for	.18
2"x2"x2" 6 for	.15

BAMBOO
1/16 sq. x 12" Gross ..... .19
1/16 x 1/4 x 15" Doz. ..... .06
Gross ..... .65

DOWELS

1/16 x 12"	
2 Doz.	.18
1/8 x 18"	
2 Doz.	.23
3/16 x 36"	
1 Doz.	.35

BALSA CARVED PROPS.

5" Doz.	.30
6" Doz.	.38
7" Doz.	.48
8" Doz.	.50
10" 6 for	.40
12" 6 for	.55

PAULOWNIA WOOD HAND-CARVED STAND-ARD PROPS.

5" 6 for	.20
6" 6 for	.30
7" 6 for	.35
8" 6 for	.40
10" 3 for	.25

BALSA OR HARDWOOD WHEELS

1½" Doz.	.09
2" Doz.	.11
1" Doz.	.14
1⅜" Doz.	.19
1¾" Doz.	.35
2" Doz.	.43

HARDWOOD NOSE PLUGS
One Dozen ..... .05

SANDPAPER
6 assorted sheets to package. 12 Packages ..... .34

COLORLESS CEMENT OR CLEAR DOPE
½ oz. Bottles, Doz. ..... .30
1 oz. Bottles, Doz. ..... .40
3 oz. Cans 6 for ..... .59
Quart 1.75
1 Gallon 1.75

COLORED DOPE
½ oz. Bottles, Doz. ..... .35
1 oz. Bottle, Doz. ..... .59
3 oz. Cans, 6 for ..... .60
1 Quart ..... .75

MODEL DOPE BRUSHES

Small. Doz.	.10
Gross	.75
Regular Size, 2 Doz.	.50

WASHERS
Small or Large 100 ..... .08

JAP. TISSUE
20"x24" Per Doz.

White	.12
Colored	.12
Silver	.36

BROWN RUBBER

1/16 sq., 225 ft.	.48
1/8 Flat, 225 ft.	.50
3/16 Flat, 225 ft.	.60

WIRE

.020, 100 ft.	.30
.028, 100 ft.	.30
.034, 100 ft.	.35

BENT WIRE PROP. SHAFTS

Dozen	.10
Gross	.75

ALUM. TUBING

O.D.	
1/16", 6 ft.	.25
3/32", 6 ft.	.28
1/8", 6 ft.	.32
3/16", 6 ft.	.43
1/4", 6 ft.	.50

SHEET CELLULOID
12½" x 16", Each ..... .15

BUSHINGS

Small, 100	.15
Med., 100	.20
Large, 100	.25

THRUST BEARINGS

Small. Doz.	.06
Gross	.55
Large. Doz.	.07
Gross	.70

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12 Packages .30

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Dozen sheets .36

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Per Dozen	.85
Extra Blades, 2 Doz.	.85

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1½", 12 for	.40
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3", 6 for	.55

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8307 New Utrecht Ave., Dept. M-5, Brooklyn, N. Y.

How to Build a Gas-powered Camera Model

(Continued from page 19)

Overall length ..... 4 ft. 10½ in.
Stabilizer span ..... 2 ft. 9 in.
Stabilizer area (21% of wing area) ..... 203 sq. in.
Fin area (8½% of wing area) ..... 84 sq. in.
Dihedral ..... 6½ degrees
Tread ..... 1 ft. 3 in.
Moment arm (40% of wingspan) .. 3 ft. 3 in.
Flying weight (complete with camera & film ..... 5 lbs. 2 oz.
Power ..... Brown Jr.
Timer ..... Autoknips
Climb per minute in still air .... 250 to 300 ft.

Fuselage

First lay out all parts of the plane, full size, by enlarging from the assembly drawing, making use of all dimensions as given. Show location of all vertical or diagonal members as well as spars, formers, etc., on your working layouts.

Begin the model by first constructing the fuselage. Make two side frames to begin the fuselage. (Shown in shaded lines.) The longerons are 5/16" sq. and should be of hard balsa. Use firm balsa for all bracing. Secure longeron stock in one length if possible, so as to avoid splicing. However, if this has to be done, merely make a long tapered splice with balsa sheet bracing on the two inner sides of the longeron. It will be necessary to steam the lower longerons at the nose in building the frames. Do not forget the removable door frame which is made at the same time, where shown, in the frame to be on the left side. When both are dry and sanded smooth on their outer sides, build them together in the usual manner, pinning each upside down on the work-bench. For clarity, no diagonal bracing has been shown on the top and bottom of the fuselage frame. This is to be 1/8" sq. balsa, installed from the wing mounting block to the rear end of the frame. See photograph showing this part completed. The next step is to build up the top, rear section of the fuselage, from the cabin back. Start it by constructing the sheet balsa covered "box" upon which the rear part of the center wing section is to be attached. Install four corner uprights of 3/16" sq., followed by the filling in of all sides (except the bottom) with 1/8" sheet balsa fillers. This must be very firmly attached to the fuselage. Cut two 1/4" sq. hard longerons and install them as indicated. Complete the top rear section by putting in all the vertical bracing, which drops down from these longerons to the exact vertical spot on the fuselage frame, be it on a cross-brace, main longeron, or both.

Cut from 1/4" sheet balsa of firm grade the rear anchorage for the motor beams. Install it in the frame so as to receive the hardwood motor beams when ready. Install two lengths of extra hard balsa, size 1/4" x 1/2", to mount the landing gear on, where shown. The actual installation of the landing gear will be made later. Now cut the nose formers Nos. 1, 2 and 3. Nos. 1 and 3 are 1/8" sheet balsa, while No. 2 is made from 1/16" sheet stock. After each has been cemented in position, cut some lengths of 1/16" x 1/8" balsa from sheet stock for the nose stringers. Each is cemented in place as shown. On former No. 3, all stringers are cut at an angle and are cemented on the underside of it, with the exception of the top center one, which is inserted in the notch provided. The firewall may now be cut and installed. Use very hard balsa of 3/8" thickness for this. Remove two rectangular holes, the size of the motor beams, and all other wiring holes shown. The stringers on the sides of the fuselage are cut from 1/16" sheet and have a long taper from each end to the middle. Cement them where indicated. The top stringer must be made later. The method of making the spring-leaf tail skid is simple; the drawing of this part is self-explanatory. It is then installed in its correct position, first being fitted to a 1/8" sheet balsa filler block which is cemented in place securely. Use metallic type cement to anchor the skid to the block.

The landing gear is made next. Form three frames (front side, rear side, and center shock strut) from 1/8" spring piano wire, using vise and hammer, laying each one over full size templates to compare. Install the front side frame first, on the balsa brace in fuselage. Use metallic cement and binding of copper wire abundantly, and also make corner braces to put against the main mounting piece. Next, install the rear section in same manner. Bind with the copper wire, both at the fuselage and at the axles. The center shock strut is of course held in position at each axle. Solder well to make a good union at each crotch, bound first with copper wire. Cut 2 sets of landing gear ribs from 1/16" sheet balsa and put them in landing gear with metallic cement.

The two hardwood motor mounting beams can be made next. Each is size 3/16" x 15/16" x 7¾" and should be made of a hardwood with the necessary "spring" in it. Black walnut is recommended for this, although maple or teakwood will do. Drill each one to take the metal plates, which serve as the actual motor and tank mounting. Then slide them through the

slots provided in the firewall and the rear motor beam anchorage, using metallic cement very generously.

The aforementioned plates should be made as the next step. See plans for detail. Each is mounted on the wooden beams with sets of screws and nuts, of the type designated in plans. The engine and tank holes shown in the plans are for the Brown Jr. engine with old-style tank and should be altered slightly for the new type Brown tank. Also, if a different make of engine is to be installed, merely alter the plate itself, where bent at right angles, to secure the proper spacing.

Carve the lower portion of the nose block from a medium hard balsa block, removing only enough wood from the interior to allow the engine, engine timer and tank to sit in position without touching. It is left solid for a good reason—to absorb any severe shock to which this area may be subjected. The top section of the nose block or engine cowl, is made from a solid balsa block, but must be nothing more than a shell with thin walls. It is used on the original merely for added appearance on the ground or photographs, never being in place when the plane is flown. This, however, can be used for flying just as readily. Cut holes in it as shown, to allow for sliding over the cylinder, needle valve and spark plug cable.

The engine accessories can be installed at this time. The battery box is simple to construct and is cemented to the 1/16" sheet balsa cabin floor, between the camera mounting and condenser. The condenser is also mounted on the floor between the battery box and the coil. Mount the coil with two supports as shown, in a vertical position against the rear motor beam anchorage bulkhead, about 1/2" away from the floor. Make sure the high tension line (to the plug) is on the top. Study the wiring diagram on drawings, wiring up everything as shown, with the exception of the Autoknips timer, which comes later. Also put in the main switch and booster plugs in the right side of fuselage where indicated. Use the small lacquer-finished stranded and tinned wire if possible, laying all runs out on the floor in systematic fashion (spot with cement). The camera mounting is built up from 1/16" sheet balsa, being directly in front of the door in the left side of the fuselage. (Pictures taken straight out through open doorway.) Lay a length of 1/8" sq. balsa on the outer top edge of the mounting to insure that the camera will be tilted at the proper angle to include left wing in photos. The Univex camera is held in position by a strong rubber band which hooks from one side of camera mounting to other. Round off the lower fuselage longerons with a plane and sandpaper.

To complete the general construction concerning the fuselage, construct the fin stub and fuselage extension (actually part of the fin). This is where the tail surfaces detach as a unit. Cut the front sections of the ribs (installed over fuselage proper) from 1/8" sheet. Install two lengths of 3/8" O.D. aluminum tubing in the front and rear sections being constructed. Use metallic cement for this. Cut and cement in place the 1/8" sheet balsa fillers, in the fin base. When this unit is complete, ready to take

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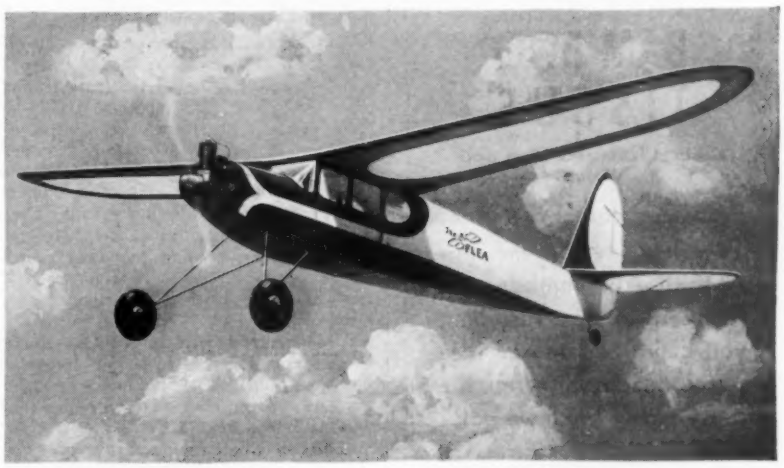

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RUBBER POWERED MODELS
LOOK, FLY, & SOUND
like real gas models

Thousands of builders have constructed these remarkable models and gotten really thrilling flights. Build one yourself and experience the fun you, too, can have with either of these fine flyers!

"THE FLEA"
HAS FLOWN MORE THAN 2 MILES (10,000 FT.)
Wingspan 36 in. Length 28 in. Weight 4 oz.

Hundreds of letters are being received daily from model builders who have built the "Flea" and had very satisfactory results. Even inexperienced model builders say that the "Flea" is extremely easy to build, taking very little time to complete. Flights of one mile or more are getting to be very common, and flights of 2 miles or more are no longer considered a rarity. The "Flea" is the next best thing to a genuine gas model! It is just the model for those desiring to gain experience before tackling a real gas model. Complete construction kit with M & M pneumatic rubber wheels.
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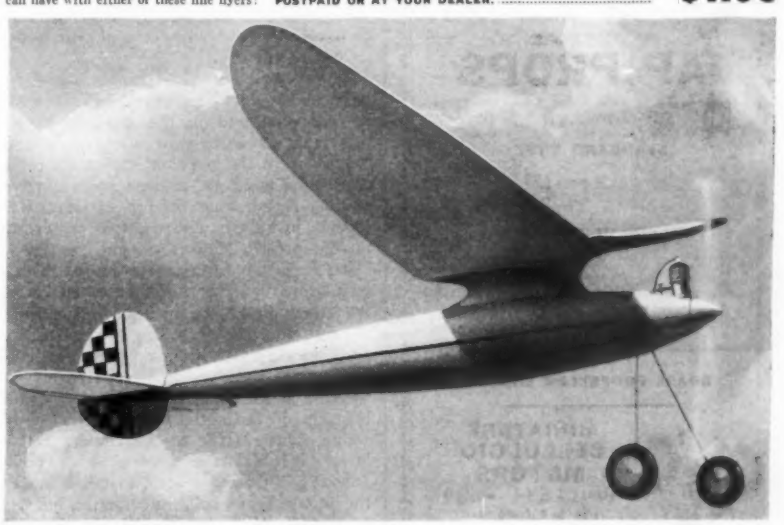

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GAS-TYPE RUBBER POWERED MODEL AIRPLANE

Wingspan 24 in. Length 15 in. Flies 1/2 mile (2,500 ft.)

The "Valkyrie" incorporates all the attractive and outstanding features of its gas model original; can be easily constructed in 4 or 5 hours. Sturdily built with continuous one-piece wing root built into fuselage and securely attached to under side of wing. Also includes the "ratchet" a device that makes it sound like a real gas model when in flight. Dummy motor looks like the real thing and is easily built. Beautifully colored: Yellow fuselage, and tail, black arrow on body, colored squares on rudder and yellow wing with black and red flashes.
Complete construction kit with full size plans and instructions.
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JAP PROPS

STANDARD TYPE

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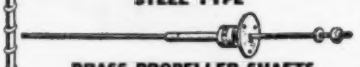

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the tail surfaces, make a paste of corn starch, clear lacquer (or dope) and aluminum powder, using it to make a generous fillet at the junction of the fin stub and fuselage.

Center Section of Wing, Windows and Timer

Begin the center section of the wing by first making two spars, each built up from three separate pieces as shown. Use ⅛" hard sheet balsa for these. This method takes care of the dihedral angle in the spars with a great safety factor. Cut four of the full size wing ribs from 3/16" sheet balsa. Leave the underside of two of them flat, for over the fuselage. The leading edge is 5/16" sq. (three sections), while the trailing edge is ⅛" x ½", tapered. Drill ⅛" holes in the four ribs to receive the ⅛" aluminum tubing. Be accurate in this operation. Cut the lengths of tubing. When center section is built, install the tubing with metallic cement. Follow with the fillers in the center section, which are 1/16" and ⅛" sheet. Now mount the wing center-section on the fuselage. It is supported at the leading edge by the two vertical window struts at that point. Cement it (using pins here and there) in place with the utmost care, noting that it is in perfect alignment with fuselage. Anchor the forward vertical braces most securely. Add the center cabin window braces next.

Paint the whole cabin area, where "raw" wood is visible, with a colored dope. Also paint the cabin roof (formed by center section) and nose former No. 3. Cut a length of ⅛" O.D. aluminum tubing and cement it in place in the center, between the wing center-section and former No. 3. The windshield can now be installed, followed by the side cabin windows. Use .015 celluloid of good quality. Refer to the windshield template on drawings. Install all celluloid with cement, using pins to secure till dry.

The Autoknips flight timer should be built in place at this point. (This timer, its use pioneered in the west, is rapidly becoming known to eastern gas modellers.) Secure it in the position shown, in center section of wing, on a sheet balsa support, making certain that the top surface of the case is just flush with the two center ribs at that point. Make the switch as shown, being certain it functions properly. Also, it will be necessary to make an extension for the timer brake, to operate this through the covering. Solder a length of galvanized sheet metal, as shown on plate 1, endways against the timer hook, which travels into the case as the timer winds down. A small hole should be in the opposite end, so the string shutter cable to the camera can be attached. Make or buy a small pulley (about ⅜" diameter) and install it against the motor beam bulkhead, on the left side of the fuselage. It should be in line with the timer hook extension. The camera shutter cable then leads from the extension on timer arm, through the cabin ceiling (at about 45° angle), straight down to the pulley and then straight back to attach on the extension on the camera shutter. (Merely a pin with loop on end, soldered on.) The procedure used in taking the pictures is described at end of article.

Now form the 1/16" stringer which extends along the top of the fuselage, in the center, from the flight timer to the fin stub at the rear. Cement it in place. Also cut and install the wing fillets at the trailing edge, between the fuselage and center-section of wing. Each is cut from 1/16" sheet stock and extends 2" each way from the corner and is actually a quarter circle around the rear edge. After cementing each against the two uppermost fuselage longerons and the wing stub trailing edge, fashion two filler pieces (about 3/16" deep at center) which are installed over the two center wing ribs and extend back on the fuselage longerons. These should be cut with a long tapered curve to fit and allow for a good blending of the wing center-section.

Building the Mauboussin Flying Tandem

(Continued from page 10)

Covering

Bend the rear hook and cement it in place. The reason for the projecting prong is to simplify rubber installation. Cover the model carefully with white tissue. Spray it lightly with water to tighten the tissue. The landing gear should be attached to the wing before covering. Use three-quarter inch balsa or celluloid wheels. Add tail skid, cockpit covering, windshield, rudder lettering and paint a black band around the nose as shown. Cement the wings and rudders in place.

Propeller

A ready formed five inch prop was used on the original and was entirely satisfactory. For those who wish to carve their own, the block size is given.

Flying

The model flies on two strands of ⅛ rubber. If weight is required on the nose to balance the ship, give the propeller a coat of dope, sanding it smooth again after the dope has dried. This will produce the required weight and strengthen the prop. The original ship, as might be expected from the size of the tail, showed amazing inherent stability. Performance is very high because of the lightness of the design. And for those of you who want something new in gas model design, build a rubber-powered model of "Hemiptere" and after you've seen her perform with rubber, imagine what a bigger gas-powered ship would do!

The Plane on the Cover

(Continued from page 10)

excellent index to the cost of modern, high-speed fighting planes.

The XP-37 is a development of the famous "Hawk" model 75. The pilot has been moved far to the rear to make room for the giant engine. Wing span is 37 feet, 3½ inches and the craft is 29 feet, 4 inches long. The powerful Allison engine is equipped with a General Electric type F-2G turbine exhaust-driven supercharger mounted flush with the lower part of the cowling. This unique arrangement cuts down resistance tremendously.

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It is the daily task of the Bunch Engineering Staff, Production and Marketing Department, to see that Bunch Motors and models remain second to none as to performance, quality and individual character. Only an organization of this calibre is equipped with the personal and physical facilities to manufacture, distribute and unconditionally guarantee every single one of its products. Whether you patronize the Bunch Model Airplane Company directly, or conveniently purchase from our numerous dealers, you are constantly assured of the best the model industry has to offer.

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For airplanes or boats, these **piston ring** equipped motors are the world's most powerful, light-weight model engines for their displacement.

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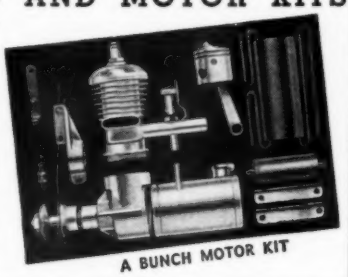
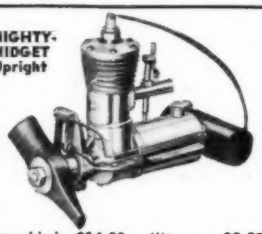
Specifications for all Bunch Motors: Bore, 7/8"; stroke, 13/16"; bare wt., 6½ oz.; 1/5 h.p. at 5200 R.P.M.; ¼ h.p. at 8500.



A BUNCH MOTOR KIT

MIGHTY-MIDGET Upright

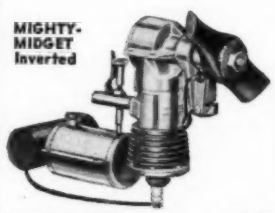


Assembled . **$14.00** —Kit . . **$9.85**

GWIN-AERO Upright

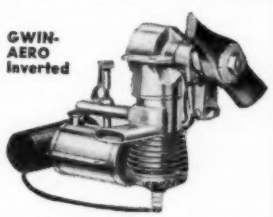
Assembled . **$17.50** — Kit . **$11.35**

MIGHTY-MIDGET Inverted



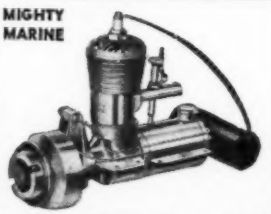
Assembled . **$17.25** —Kit . **$10.10**

GWIN-AERO Inverted



Assembled . **$18.25** —Kit . **$11.60**

MIGHTY MARINE



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Today's greatest motor value. Assembled, mounted and tested, only

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The Sea Hornet is the most thoroughly worked out, gas-powered speedboat kit today. Balsa construction, 24" long, 9" beam, speed 20 M.P.H. Comprehensive instructions and 20 step-by-step drawings make construction simple.

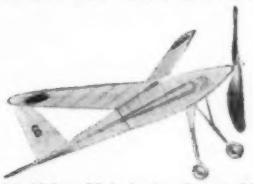
Master Kit—Complete with full-size drawings; ready-cut frames, sheer planks, motor mount beams, keel, knee, stem pieces; threaded drive shaft, coupling, rear strut, propeller, driving dog and stuffing box. Includes cement, dope, fabric and every part to build as illustrated.

Master Kit—Nothing to buy but the engine..... **$11.50**

Special Kit—All parts as in Master Kit, less only cement, dope, fabric, wiring and propeller drive. (Stuffing box and other fittings furnished)..... **$7.50**

Plans and Instructions only..... **50c**

RUBBER MODELS



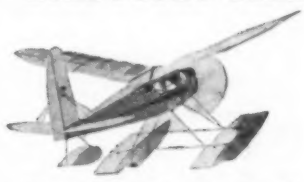
Cadet Major—30-inch duration model. Fuselage design controls slip-stream. Kit, complete with rubber lube, carved prop, and freewheeler, postpaid **$1.50**

Cadet Junior—20-inch wing. Rubber lube, carved prop, balsa wheels, free-wheeler. Price, plus 10c postage..... **50c**

Special—Both kits, Cadet Major and Cadet Junior, postpaid..... **$2.00**

Super Scorpion—Cabin type. 20-in. Flying records of this rubber model established basis of the Scorpion Gas Model design. Flies in all kinds of weather, postpaid..... **$1.00**

GULL FLOAT GEAR



Equip your present ship with the Bunch Gull Float Gear. Any 3- to 6-lb. gas model easily operated over lakes or bays. Balsa construction, fabric covered. Weight, 12 oz.

Master Kit—All materials to build, waterproof and install on any airplane, postpaid..... **$6.75**

Special Kit—Less chemicals, strut wire and fabric, postpaid..... **$3.00**

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Wing span 57"
Length 41"
Weight 3 lbs.

Amazing performance of Scorpion Senior and Scorpion Major attested by thousands of flights.

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- "Autoknips" timer and all fittings.
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- Grade "A" selected hard balsa.
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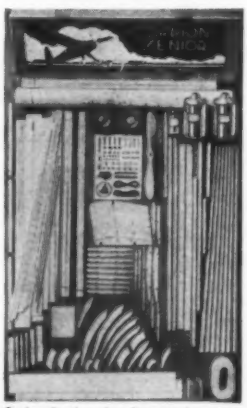
Master Kit (as pictured)..... **$10.50**

Standard Kit (less only timer, wiring, propeller, shaped cowling..... **$6.95**

Special Kit (less chemicals)..... **$4.95**



Order **Senior** for **Inverted** motor. Order **Major** for **Upright** motor.

Plans, Instructions only..... **50c**

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The propeller is the Curtiss "full feathering" electrically-controlled model which gives the ship astounding take-off and flight characteristics. Preliminary performance figures just released by the Air Corps' Material Division at Wright Field where the tests were conducted, reveals that the XP-37 has a top speed of 355 miles per hour and a cruising speed of 326 miles per hour, phenomenal performance and far speedier than that of major European powers. The service ceiling is 33,000 feet and the craft can climb 4,200 feet per minute.

The pilot is located near the rudder, as on our modern racing planes, and is protected from the blast of the air stream by a neat, sliding, glass enclosed hatch. Complete oxygen equipment is carried for operation at the extreme altitudes of which the XP-37 is capable. In addition, the cabin is a veritable maze of complete radio sending and receiving equipment, flight and navigational aids, machine-gun controls, propeller feathering control, and various supercharger, landing gear and trimming tab controls. It would appear that the pilot had more than enough to do to fly his ship while hurtling across the skies at 350 miles per hour so that he is undoubtedly a busy man in combat operating the gadgets and apparatus.

Armament aboard the XP-37 consists of two, electrically-controlled, high-speed Browning MG-53, 50 caliber machine guns mounted just under each bank of the powerful engine and firing through louvres in the cowling. These guns have been synchronized to fire through the whirling three-bladed propeller in any of its "feathering" attitudes, a difficult problem from the start.

Tests have also been carried out on the installation of a secret 37 millimeter aerial cannon mounted between the banks of the "V" shaped engine and firing through a hollow propeller shaft.

During these tests a fixed pitch, two-bladed propeller was used as satisfactory installations of hollow, controllable pitch, propeller shafts have not as yet been designed.

The cannon is capable of firing about 60 rounds per minute and the rapid fire Browning guns will deliver 1,200 rounds per minute. Thus, with the nose cannon and the two machine guns installed, the XP-37 is a veritable "flying arsenal" capable of tossing lead to the tune of 3,000 slugs per minute! Pity the luckless enemy airman caught in such a hail of concentrated lethal punishment.

Construction is of all-metal throughout and the landing gear folds backwards and upwards into twin recesses in the wing. Through the use of an ingenious bevel-gear arrangement, the wheels lie flush with the wing. The XP-37 weighs 5,420 pounds when fully equipped and ready for flight, which includes fuel enough for a range of 625 miles. Thirteen of these ships will be operated by the 17th Pursuit Squadron of the 1st Pursuit Group, GHQ Air Force stationed at Selfridge Field, Mount Clemens, Michigan, for a period of one year. Following these service tests under the designation Y1P-37, should the outcome meet with the high expectations of both the manufacturers and the Air Corps, a large order will be forthcoming.

Can You Solder?

(Continued from page 17)

Well, that sounded rather easy, didn't it? And it really is once you become used to it.

Now for some trouble shooting. If, after you have followed the above instructions, the solder does not flow but remains bumpy and appears to have little ridges in it, this is due to the fact that not enough heat was applied. This can be remedied by holding the iron against the joint until the solder flows freely over all parts of the connection.

When the solder flows freely but forms little balls which roll off the connection, one of two things can cause it. Either an insufficient amount of flux was used, or the iron was not applied directly to the wires. Always remember that the temperature of the wires must be brought up above the melting point of the solder before the solder will flow over and unite with the metal.

The same procedure is always followed whether it is an electrical connection, a gas tank or a wing fitting that is being soldered. Always remove all dirt, spread the flux, heat the metal and apply the solder.

A small iron can only hold a certain amount of heat, and when it is used to try to solder a heavy gas tank or axle fitting, it may often give off most of its heat before the job is finished.

When this happens the solder starts to flow but suddenly becomes stiff and lumpy, and continued use of the iron only makes it worse. The best thing to do is to withdraw the iron, and let it regain its heat if it is an electric iron and only use it for a few seconds at a time until the joint is finished.

There are many other jobs which require a knowledge of the fundamentals of soldering and once you get the hang of it and find out how easy it is to do, you might put your newly found knowledge to use in making things of sheet metal or repairing objects around the house.

A Low "Aspect" Indoor Tractor

(Continued from page 31)

Tail Assembly

Boom: Motor stick wood is also used for the boom blank. The 10½" blank is sanded to weight .0015 oz. Finished it weighs .0019 oz.

Stabilizer and rudder: The stab. construction is similar to that of the wing. The stab. and rudder frame together weigh .0022 oz. Covered they should weigh .0032 oz.

Propeller

The propeller was carved from average weight wood (5 lb./cu. ft.) Using wood of about 3½ lb./cu. ft. the same prop could be made to weigh approx. .009 oz.

Procedure: Select the lightest blocks of wood obtainable, then inspect the radio lines. Use the block in which the lines run at about 45°. This will give your prop full Q.G. about one-half of the diameter. For further details on carving and using proper methods, the author suggests reading the article by Carl Goldberg in the January,

IDEAL'S I.G.M.A.A. TROPHY WINNER

Fly this Record Breaking AIR CHIEF . . .

AIR CHIEF Wins Again!

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- Wingspan 61"
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- Weight 2½ lbs. without motor

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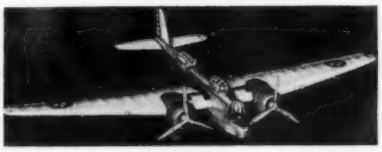

NEW SUPER-DETAILED MARTIN BOMBER

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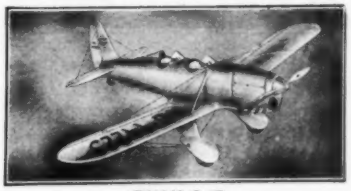
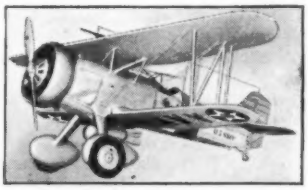


RYAN S. T.

Wingspan 22⅛", length 16⅛", weight 2½ oz. Dual control system, adjustable wing flaps, cylinders with movable pistons, carburetor and spark plugs, plans for work engine. COMPLETE KIT..... **$1.50**

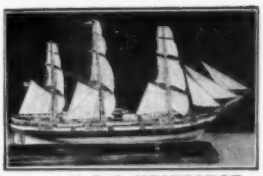


CURTISS GOSHAWK

Wingspan 23⅜", length 16¾", weight 3⅜ oz. Streamlined drag ring, two detachable blade propellers, new IDEAL high lustre finish with silver, yellow, red and black coloring. COMPLETE KIT..... **$2.00**

CUTTY SARK

Carved wood hull printed balsa decks, Cast metal: lifeboats, anchor, bitts, steering wheel, chains. Masts, spars, rigging cement, colored lacquer, full size plans, instructions. COMPLETE..... **$2.50**



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- Historic
- Beautiful
- Complete

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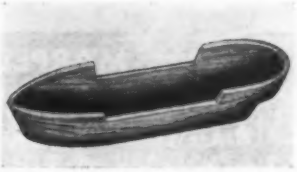
DEALERS!



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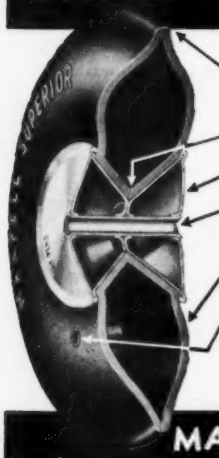

No other wheel has all these patented features:

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- **Full Diameter Pneumatic Cushion.** Fifty per cent more resiliency with shock absorption right to the very axle
- **New Patented Duralumin Hub.** Fabricated all-metal hub, of conical shape, saves weight and can not rim cut. Polished to a bright chromium finish.
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- **Finest Grade Ebony-Finished Rubber.** Smoothly vulcanized to an even .072" wall thickness . . . black satin finish not affected by heat or cold.
- **"Air-Check" Inflation Valve.** Holds full pressure indefinitely . . . valve is flush with tire . . . inflates with ordinary tire pump.

This new, no-leak, patented "Air-check" inflation valve is guaranteed against defect. Entirely original in design, this valve will not leak by outside manipulation or on landings To regulate pressure, a simple adapter that fits any tire pump is furnished with each pair

Your choice, 4½" diam., wt. 4 oz. pr.; or 3½" diam., wt. 3 oz. pr., either size.

Per pair . . .

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1938, issue of the MODEL AIRPLANE NEWS.

Do not depend upon one prop for consistency. Every individual works differently and the weather is so variable that one should carve at least two props of different dimensions. The author suggests these: For average conditions a prop carved from a 13"—7/8"—1½". For ideal conditions use prop of 13½" diameter of same dimensions as above.

If you are using but one prop it is best to vary the motor length accordingly. For example: In normal conditions (usually terrible) use a short motor of about 17" and possibly less. Under good conditions use from 18" to 20" length of motor. Success of your flights depends largely upon your ability to use proper propeller and power.

Adjusting and Flying

Sighting down the motor stick, see that the right half of the stab. is set at zero degrees and the left half of the stab. is set at negative 3/32". With this arrangement the stab. as a whole has but 3/128" negative or about one fourth of one degree. Consultation of McBride's indoor airfoil chart reveals that in this case the stab. would lose about 5% of its maximum lift. However, because of the added stability during the initial burst, the plane is able to assume its climb without loss of power. After the stab. is properly adjusted, offset the entire stab. to the left about ½" (front to rear of the stick), left tip of the stab. is washed down about ½". In flight the wing will automatically assume a position nearly parallel to the stab. This also is an aid for power adjustment.

Mount the wing on the stick about 1¾" from the bearing and give the right half of the wing about ¼" washin. (This increases the total incidence of the wing to ¼"). Select proper length motor of brown 1/16" rubber, wet and tie a square knot, use resin or talc on the knot for safety. If the tractor is heavier than required then use a 5/64" motor and place the wing back to 2" from the bearing, to compensate for the additional weight in the rear of the original center of gravity.

Glide tractor and if it descends too steeply, check the incidence; if correct then move wing up ¼" and if dive still persists add 1/16" incidence and move wing back to the original position. If the tractor at first stalls then check the stab. for excessive negative. If correct, move wing to 2" from bearing. Should the stall continue, remove 1/16" from front clip.

If the tractor glides well one may test under power. Wind 800 turns into the motor stretching rubber only twice original length. Launch plane banked slightly to the right and pointed up slightly. If the plane does not assume the proper climb angle, then bend bearing up and retest. If the plane stalls or mushes, bend bearing down. Assuming that the plane acts like a gentleman (not like a woman) under 800 turns, you are now ready to increase turns to 1200. If the plane banks sharply to the left, increase the washin, if it has a tendency to skid or the wing attempts to washout, decrease washin, and increase washout in right wing half.

Under full turns the tractor should climb very steeply (30°) in circles of about 20' diameter. With proper adjustments the tractor should descend with less than 150 turns left in the motor.

In conclusion bear this in mind, "The more you use your head the less wood you will need." Here's to emery dust in your lub.

The Earth As a Target

(Continued from page 8)

the wings and the gun turrets, along with the excellent visibility which it afforded, made it the best constructed fuselage of its period. The "Panther" was the first bomber to employ the then experimental type radial engines.

Two "firsts" in the design of bombers were introduced when the Douglas folding wing T2d-1 and the Fokker high-wing monoplane the X1B-2 came into existence. The Douglas plane was the first bomber ever to have folding wings and the Fokker monoplane was one of the first American bombers of the single wing type. The Douglas was a twin-engined biplane and

carried its bombers and gunners in the nose of its fuselage in a manner similar to other planes of its day. It was used mostly by the Navy. The Fokker monoplane proved to be the faster of the two. Its visibility features greatly outclassed those of the biplanes which were then predominant in the Air Corps as bombers.

Shortly after the Fokker X1B-2 was purchased by the Army there occurred a period of drastic change in the design of bombing planes. Monoplanes took the world by storm and soon most of the bombers were either low-wing or high-wing types. Among the first of the low-wingers was the Boeing introduced in 1930. These ships looked more like cigars with wings on them than anything else but they were capable of speeds which before their time had seemed almost unattainable. They were the true forerunners of the giant "Flying Fortress" of today.

Within a year after the first Boeing low-wing bomber was pressed into service the Martin Company produced a ship which, although similar in design to the Boeing, had many new features and could attain even greater speeds. Both of these planes, the Boeing bomber and the Martin bomber, brought about a new feature for bombardment planes by introducing the retractable landing gear which was drawn up into the wings, thus cutting down air resistance and making possible increased speeds.

As proof of the performance of the Martin B-10 bombers several of the planes were taken on a survey flight to Alaska in 1934. They not only made the flight in record breaking time, but they proved their worthiness under severe weather conditions. The icy cold of the Arctic climate had little effect on them and they proved that a long distance mass flight of bombers was no longer merely a vision, but a true outcome of progress.

Following the introduction of the low-wing bombers the Douglas, Boeing and Martin Companies submitted new planes for use by the Air Corps. These planes were the Boeing B-17, the Martin B-12 and the Douglas B-18. They were produced in 1935 in what is better known as the "contest of three" for it developed that each of the companies were in competition with each other to determine which one had the best plane. All of the entries proved to be such excellent performers that all three were purchased by the Army and are now in use in the Air Corps.

Also about this time Bellanca came out with a twin-engined high-wing bomber which proved successful both as a land-plane and as a seaplane. It was capable of carrying 2,200 lbs of bombs at speeds almost equal to those of the low-winged giants. It saw active service in a South American revolution.

However, the greatest advancement in bombers has occurred within the past year. Today the giant bombers of the Army Air Corps differ only slightly from the luxurious airliners that ply between American cities in the greatest network of airlines in the world. Most noted of the recent types is the Boeing B-17, better known as the "Flying Fortress."

This giant of the skies represents the

SCIENTIFIC

NOW OFFERS YOU AMERICA'S FINEST MINIATURE

GAS ENGINE

AT A RIDICULOUSLY

LOW PRICE

1938 MODEL "D"

BROWN JR.

ONLY

$10

COMPLETE READY TO RUN

POSTPAID

—IMMEDIATE DELIVERY—

Yes! This is the exact same engine that has sold for $17.00 up to only a few weeks ago. The same high quality metals, alloy steel cylinder with aluminum alloy piston and 2 special rings, forged aluminum connecting rod, simplified pin type control, and other high quality features.

Not long ago you had to pay as much for a knockdown motor kit as you do now for the completely finished ready-to-run Brown Jr. precision motor. The new low price of $10.00 for such a high quality motor is really startling and is only possible through the geared up high production methods now adopted by the Junior Motors Corporation. Nothing is being spared to give you the finest miniature gasoline engine manufactured in the world today. Every piece is accurately machined to the finest dimensions. For the power delivered, the Brown Jr. motor is undoubtedly the lightest miniature gasoline motor manufactured, and the power—weight ratio compares favorably with high powered commercial aeronautic motors. Every engine is assembled by expert workmen and sent to the Junior Motors Laboratory to be thoroughly tested and run under actual performance conditions. When sold, the motor is complete and ready to run except for gas and batteries. Every engine is guaranteed to run and is sold under these conditions.

For 100% satisfaction power your model with a Brown Jr. Motor. Order early from Scientific for immediate delivery.

Complete engine ready to run, including fuel tank, coil, condenser, propeller, motor operation manual, etc., for only $10.00 POSTPAID.

FREE Propeller especially designed for the Brown Jr. motor, bottle of oil, and double guarantee with every engine. This is a special offer made only by the Scientific Model Airplane Co. Order NOW!!

DOUBLE GUARANTEE

Buy your gas engine from SCIENTIFIC and you will be protected by the double guarantee—guaranteed by the factory and again by SCIENTIFIC.

GENERAL SPECIFICATIONS

⅞" Bore, 1" Stroke
1,200—10,000 R.P.M.
Height 4½" in., ⅓th horsepower
Actual scale weights:
Bare motor..... 6½ oz.
Complete with coil, tank and condenser as furnished ..... 11½ oz.
Ready to run with gas, two batteries, and propeller..20½ oz.
Two standard 1½ volt flashlight cells required for current.

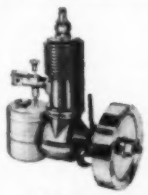
BROWN JR. MOTOR PARTS

Crankcase and bearing	$2.25
Cylinder or cover gaskets, each	.05
Needle valve (Models C & D)	.10
Breaker spring contact & ferrule	1.00
Breaker clamp & contact	1.00
Breaker bushing	.50
Spark plug gasket	.05
Brown Jr. condenser	.25
Set—washers, gaskets, nuts, etc.	.50
Gas motor operation manual	.10

DEALERS: Write today for discounts on the new Model "D" Brown Jr. motor or order immediately from Scientific at regular discount quoted you. The amazing low price for such a high quality engine puts it within reach of every model builder. Sales will be terrific.

OTHER BROWN JR. ENGINES

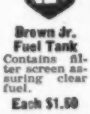
MODEL "B"
The Model "B" Brown Jr. motor, long famous for its power, smooth running and compression, is manufactured under high and exacting standards. For ease of starting and long life, look to the steel, and you will look to the Brown. Complete with special designed propeller. Postpaid.
$21.50



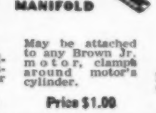
MODEL "M" MARINE ENGINE
This new Marine engine for model boats is built to the same high and exacting standards as are all Brown Jr. engines. Engine comes complete including flywheel, coil, condenser, fuel tank, etc., ready for mounting in boat. Tested and Guaranteed. Postpaid.
$15.00

ACCESSORIES

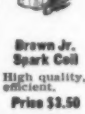
Brown Jr. Spark Plug
Formerly sold for $1.00.
Now Only 65c



Brown Jr. Fuel Tank
Contains filter screen assuring clear fuel.
Each $1.50

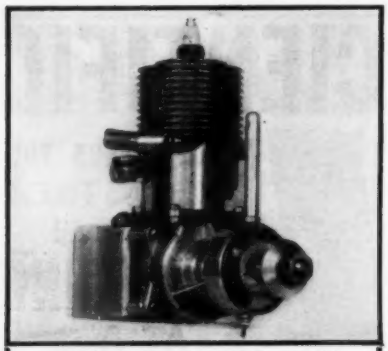


May be attached to any Brown Jr. motor, clamps around motor's cylinder.
Price $1.00



Brown Jr. Spark Coil
High quality, efficient.
Price $3.50

SCIENTIFIC MODEL AIRPLANE CO.
218-220 MA-5 Market St.
Newark, N. J.



AMERICA'S FINEST MODEL MOTOR

LITTLE HERCULES is built to the highest standards, has every modern improvement. You can expect better results. At the recent Chicago Boat and Sports Show, FORSTER BROTHERS motors, in competition, took the first three places.
For supreme flights with such planes as the KG3, the SUPER BUCCANEER, and the CUSTOM CAVALIER, you cannot beat it. At contests especially, will you appreciate its quick starting, its reliability, and reserve power. It has enough soup for that radio controlled job you have in mind. Actually, FORSTER BROTHERS motors weigh less per H. P. than weaker motors.
Let not a cheap price mislead you. Quality and consistency can only be had by paying for them. You will be more satisfied in the end by buying the finest motor in the first place. For planes from 7 to 12-foot wingspan. Priced at $17.75, complete with coil and condenser.
For this month only, we will include our 18" diameter, $2.00 value propeller, free, with every motor ordered from the factory. ORDER YOURS TODAY.

Enclose stamp for literature.

FORSTER BROTHERS
519 Lake Street, Maywood, Illinois

"IMP" Gas Props
REG. U.S. Pat. Office

PERFORMANCE PRECISION PERFECTION 5c

Offer Expires July 1, 1938

Designed for use on any popular gas motor. Tested for efficiency. Hand made of the very finest wood obtainable, finished with hard surface lustre lacquer.
BUY ONE OF THESE PROPS AT PRICE LISTED AND FOR 5c MORE WE WILL SEND ONE OF OUR NEW E.C. TYPE (WALNUT PROPS) OF THE SAME SIZE.
GA-GB-GC—12"-12½"-13"-13½"—85c each. PLUS 10c POSTAGE.
GA-GB-GC—14"-14½"—$1.00 each. PLUS 10c POSTAGE.
GA-GB-GC—15"—$1.10 each. PLUS 10c POSTAGE.
SPECIAL—4 PLY—LAMINATED—12" & 13"—$1.25 each—14"—$1.35—15"—$1.50. If in doubt about which type to use—send name of motor & plane with order.
INTERNATIONAL PRODUCTS ARE SOLD ALL OVER THE WORLD.
Send 10c for complete catalogue of model airplanes, boats, gas, electric & dry ice motor, model trains, charts & guides.

INTERNATIONAL (PROP DIVISION)
251 W. 55th St. New York

progress that the bombing plane has made in the last two decades since the war. But more than that it represents the greatest bomber in the world and the accomplishment of aeronautical experts both from Army and civic ranks.

Into its large 100 ft. all-metal wing have gone technical ideas of construction which were learned only through years of practical experimentation. Its 700 horsepower Pratt and Whitney engines give it a speed which ranges between 200 and 250 miles per hour, almost equal to that of the modern pursuit planes—more than double that of the planes used during the war.

It has accommodations for a crew of nine. From a more militaristic standpoint it has no "blind spot" a fatal weakness of many of its predecessors, this being one of its outstanding characteristics. This means that there is no angle at which a plane might atack it without the attacking plane crossing the line of fire from one of the bomber's guns.

"Blisters," more commonly known as gun turrets, are placed at important defensive points along its fuselage. There is one to the rear of the fuselage near the tail, another underneath the plane's body which makes it impossible for an enemy ship to attack from below. Still another in the nose and two are located in the wing, one on each side of the giant fuselage.

Bomb racks capable of carrying great loads of the modern types of bombs add to its deadliness. But its high altitude and cruising range give it qualities which make it the "ideal" bomber.

In the air the sun's rays glisten as they strike the silvery all-metal wing and fuselage.

That such a beautiful and graceful bird as it appears to be when flying above the earth, could bring ruination to great cities by merely releasing the bombs which it carries—seems almost an unbelievable axiom.

But even as this is being written another giant of the skies, the Boeing B-15, is winging its way from El Paso, Texas en route to Wright Field to be accepted into the Air Corps. This new bomber is even greater than the "Flying Fortress" though it is similar in appearance to that plane in design.

It has a gross weight of more than thirty tons, is approximately ninety feet long, eighteen feet in height and its wings have a spread of one-hundred and fifty feet. It is a streamlined, mid-wing type, all-metal monoplane like its sister ship, but is noticeably larger. Four 1000 horsepower twin-row Pratt and Whitney "Wasp" engines supply its power.

This new ship has its own generators which supply it with its electrical current. It has a double truck landing gear with four huge pneumatic tires. Both landing gear and tail wheel are retractable.

Complete living and sleeping quarters for the crew are included in the plane to accommodate the flight personnel during sustained operations. The kitchenette contains electric hot plate percolator, soup heater and dry-icebox. The working and living quarters are thoroughly soundproofed, heated and ventilated. It is also equipped with all the modern safety devices including radio equipment, automatic pilot, de-icing installations, fire protection instruments and wing flaps to reduce landing speed.

It has six enclosed machine-gun turrets, one on top of the fuselage, one in the nose, one on each side of the fuselage and two on the bottom of the fuselage.

According to tests in Seattle, indications pointed to the fact that it was to be a super flyer as well as a super bomber. Army Air Corps officers were interested in comparing it with the "Flying Fortress" to see which of the two was the greater.

But one must bear in mind that aside from the graceful lines and flying qualities of these ships of the skies—they are bombers—the greatest that Uncle Sam can provide for his Air Force. It is their duty to carry bombs—to destroy any country which might trespass forcibly upon American soil.

Their target is the earth.

What is My Gas Job's Performance?

(Continued from page 13)

from (10) to (24) in the (A) column. Thus the various intersections of horizontal and vertical lines represent planes of various areas and weights. The point (E) represents a plane that has a total wing area of seven square feet and weighs four pounds.

The junction of the vertical line from (7) and the horizontal line at (14) represents a plane which has a wing area of 14 sq. ft. and weighs 7 lbs. Such a plane will have a wing loading of ½ lb. per sq. ft. or 8 oz. per sq. ft. Therefore if a line is drawn through this point and (0) at the lower left corner of the graph, all the points on this line will represent planes of various areas and weights which have a wing loading of 8 oz. per sq. ft. The lines representing planes of other wing loading values have been determined by similar means and are indicated on the chart. Planes with a wing loading of more than 8 oz. per sq. ft. are represented by points *below* the 8 oz. per. sq. ft. line.

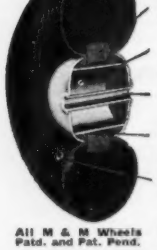
Model builders will agree that there is a limit of lightness to which a plane can be built, for any given wing area. UP TO THIS LIMIT the lack of structural weight for any given power plane, wing area and strength factor is proportional to the genius of the

BUY YOUR BROWN Jr. MOTOR FROM M & M

NEW TYPE "D" only $10.00 Postpaid Ready to Run
Specifications ⅞" Bore, 1" Stroke, ½ HP.-1200 to 10,000 R.P.M.

Type "C" $17.00 Postpaid
Type "B" $21.50 Postpaid
Send To Us For Immediate Delivery

Champion New Plugs Only 65c Prepaid
Hurleman Come Apart Plugs Now Only 75c Prepaid



All M & M Wheels Patd. and Pat. Pend.

Gas Wheels Rubber Powered Wheels

When Thinking of Model Protection Think of M & M Super Wheels

3½" & 4½" Gas wheels—weight 2½ and 5 oz. per pair. Now only $2.75 per pair, postpaid

M & M Super Heavy Duty Wheel for Rubber Powered Models

SIZES 1¼—1⅜—1½—1⅝"—PRICE $0.50 Per Pair, Postpaid.
SIZES 1⅞—2—2⅛—2¼—2⅜—2½—2⅝"—and Special Designed Do-Nut Wheels. Size 1¾"—PRICE $0.60 PER PAIR, POSTPAID. For Air Mail Add 11c.

M & M's FOR LARGER GAS MODELS
Size 6"x1⅞". Price $4.50 per pair P.P.

M & M 3¼" GAS WHEELS

with improved M & M axle housing for 9/64th or No. 28 drill rod axle Designed for Light Weight Gas Models. Weight approximately 1½ oz. per pair. $1.50 Per Pair Postpaid For Air Mail Add 21c

Buy M & M WHEELS From your Dealer or send to us.

All M & M Wheels can be inflated & deflated. If located in Washington add State Tax.
Dealers: Our New Discounts Are Very Attractive.

M & M MODEL WHEEL CO.
325 North 70th Street Dept. M5, Seattle, Wash.

designer. In determining a practical limit of lightness we are not concerned with planes that may get off the ground and fly only to collapse under severe flight strain.

Such planes are not practical. This limit must be a safe practical one, based on the characteristics of the lightest models that have demonstrated their ability to make normal flights and yet "hang together." The line on the chart marked *"minimum practical wing loading,"* represents this limit of lightness to which planes of various areas may be built, when customary structural practice is followed. The position of the line on the chart has been established on the basis of the area and weight of the lightest gas models that actually have been built and flown with a 1/5 hp. engine. Planes with a given wing area possibly can be built, which are lighter than planes represented by points on this line, but at least the minimum values represented by this line on the chart will serve as a practical means of comparison.

You will note that the point at which the minimum weight line intersects the zero area line, represents a weight of about 26 oz. according to the weight scale at the bottom of the graph. This is the weight of the complete 1/5 hp. engine unit and its mounting. At this point the wing area is (0) and therefore there will be no wings and consequent structural weight besides the weight of the power unit. The increase in the weight of a gas model from this point is practically proportional to the increase in wing area. Therefore the line runs straight upward and to the right across the face of the graph to the point representing a plane of 7 lbs. weight and (19.7) sq. ft. of wing area. It is assumed that 7 lbs. is the lightest weight to which a plane of (19.7) sq. ft. of wing area may be built, when powered with a 1/5 hp. engine. This assumption is the result of the study of the area-weight ratio of actual planes that are considered to be constructed at the limit of lightness.

Now if we examine the chart, it is evident that if a gas model is to be built with a wing loading of more than 8 oz. per sq. ft. it will be represented by a point on the chart that is not only below the 8 oz. per sq. ft. line, but which lies to the right of the *minimum practical wing loading line.*

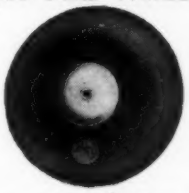
In the preceding article, through a system of exploration of performance characteristics, taking actual airplanes of various sizes as examples, an estimate of the maximum performance of a gas model was made. The formula used is as follows:

$$F = \frac{(R.P.M.)\ A\ Cu}{40\ W^2},$$

where (F) represents the performance coefficient, (A) = the wing area in sq. ft.; (Cu) = the volumetric displacement of the engine piston; and (W) = the weight in pounds. By means of substituting in the formula the values of area, piston displacement (0.6) and weight of the gas model that was estimated as being capable of maximum performance, it was determined that (F) would have a value of (31.14). This is therefore the coefficient for the estimated maximum performance. The performance curve for this coefficient (31.14) can now be plotted. This is done by solving for the value of (A) when various values of (W) are inserted in the formula:

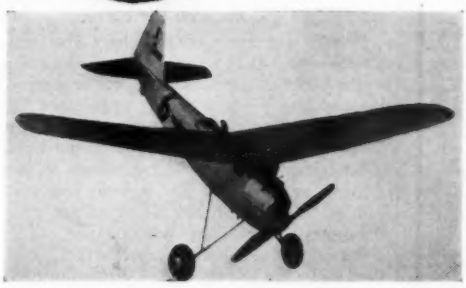
MODELCRAFT Value of the Month

VOIT AIR WHEELS 2½ in. **$1.00**



3½" - $1.50
4½" - $1.75

Let your ships rest safely and easily on Voit Air Wheels, the nationally known model-plane wheels of flawless, heavy-duty rubber. Inflating tools in each package. Special valve in 3½" and 4½" sizes. Order yours today.



THE NEW 1938 SCOUT

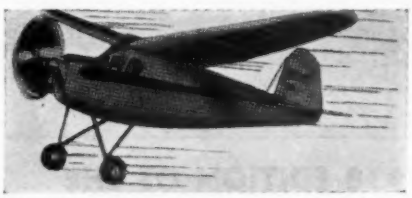
A Big Ship For Powerful Flying Powered by Midget, Dennymite, Cyclone, Ohlsson or Brown engine. The Scout is new throughout with 60" tapered Clark Y wing, new design, and parts with latest improvements. Kit contains formed landing gear, ready-cut ribs, formed face plate and cowl, switch, hook up wire, cement, dope, silk, full sized plans and Voit air wheels. Only..... **$7.25**
Prepaid in U. S. A.

Special money saving deal: Kit, Timer and Ohlsson engine..... **$25.00** SAVE $2.25

Same kit with bamboo paper and rubber Donut wheels $4.85
Dry Kit: No cement, dope, covering or wheels....$3.75

THE PACIFIC ACE

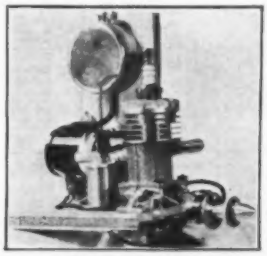
This graceful, high-flying, light-weight ship is very popular this season. Kit is fully equipped, including ready-cut ribs, beveled trailing edge and real silk. Power with Brown, Ohlsson, Cyclone, or Dennymite engine. Weight ready to fly, 3 lb. 4 oz. Wing span 60", standard kit..... **$8.50**
Price prepaid in U. S. A.
Same kit less air wheels, silk, cement & dope.....$4.75



THE FALCON

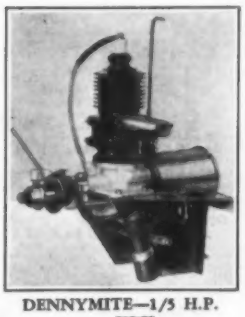
POWER WITH BRAT, TROJAN, HUSKY, ELF OR CHUNN ENGINE. Boys, here is the plane for you. Easy to build, and flies smooth as a Gull. 38" tapered wing. Kit complete with cement, dope, wheels, covering, printed ribs, formers, etc. **$1.50**

Deluxe kit with Traxler air wheels and silk covering **$2.95**

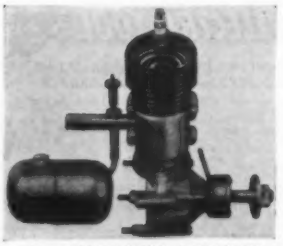


HUSKY JUNIOR
$12.50

At last, a powerful lightweight engine at a price you can afford to pay. ⅝" bore, 5/9" stroke, 4 oz. weight, and 250 to 10,000 R.P.M. New, float type carburetor. Only $12.50.



DENNYMITE—1/5 H.P.
$16.50
Especially adapted to the Pacific Ace



1938 OHLSSON ENGINE
1/5 H. P. $18.50
A high-powered unit

SOGARD PROPELLERS

49c

9", 12", 13", 13½", 14"

Yes, this same high-quality Sogard Propeller is sold at an amazingly reduced price. It is the prop with true pitch, accurate balance, maximum thrust and minimum torque. Take advantage of this sensational offer. Order today!

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7306 S. Vermont Ave., Dept. B, LOS ANGELES

THE LEADING SUPPLY HOUSE OF THE WEST

IMPERIAL LEADS

IN QUANTITY, QUALITY, AND VALUE

24 HOUR SERVICE FREE POSTAGE on all orders for 75c or over

SEND 2c POSTAGE FOR COMPLETE CATALOG

18" BALSA

1/16x1/16, 100, 5c
1/16x1/4 35 for 5c
1/16x3/16, 18, 5c
1/16x1/4 15 for 5c
1/16x1/2 5 for 5c
3/32x3/32 30, 5c
1/8x1/8 30 for 5c
1/8x3/16 12 for 5c
1/8x1/4 10 for 5c
3/16x3/16 8, 5c
1/4x1/4 6 for 5c
1/4x1/2 3 for 5c
1/2x1/2 2 for 5c
1/64x2 4 for 10c
1/32x2 8 for 10c
1/16x2 8 for 10c
3/32x2 7 for 10c
1/8x2 6 for 10c
3/16x2 2 for 9c
1/4x2 3 for 10c

3" sheets or 36" lengths, double above prices; add 10c packing charge for 36" lengths.

18" PLANKS

1x1 5c; 1/2x2 6c
1x1 1/2 9c; 1x2 10c
1x3 15c; 2x2 18c
2x3 23c; 2x6 39c
3x3 40c; 3x6 75c

NOSE BLOCKS

1x2x1 ..... 1c
2x2x1 ..... 2c
2x2 1/2x1 ..... 3c
3x3x1 ..... 5c
3x3x2 ..... 8c
3x3x3 ..... 10c

TISSUE, AA

All col. ..doz. 10c
Silver ....ea. 5c
Superfine, wh. 5c

WHEELS per pr.

	Birch	Balsa	Celu
1/2	.01	.03	
3/4	.02	.04	.05
1	.03	.05	.07
1 1/2	.04	.08	.10
1 7/8	.07	.10	.16
3	.15	.15	.30

WASHERS

1 doz. 1/4 or 1/2 1c

THRUST BEARINGS

Small ....doz. 10c
Large ....doz. 15c

Your choice of one of these **FREE OFFERS** with all orders for $1.00 or over

FREE

A. Large bottle clear cement and 60 1/16 x1/16x18 balsa
B. 2 pr. 1 3/8" Birch Wheels
C. 3 sheets silver tissue
D. Membership Pin in **IMPERIAL MODEL CLUBS** which entitles you to 5% discount on orders of $2.50 or more

Send 3c Pstge. for Gas Mod. Cat.

CLEAR DOPE or THINNER

5c per oz.; large bottle, 8c; 1/2 pt. 30c; 1 pt. 45c

COLORED DOPE

6c per oz.; large bottle. 10c

CLEARCEMENT

5c per oz.; large bottle, 8c; 1/2 pt. 35c; 1 pt. 55c.

PROPELLERS

Balsa	Paul-O-Mach. Cut	Wina
5"	4c	10c
6"	5c	15c
7"	6c	20c
8"	7c	25c
9"	8c	30c
10"	8c	35c
12"	10c	45c
14"	14c	55c
15"	15c	60c

RUBBER

.045 .....25 ft. 5c
1/16 sq., 15 ft. 5c
1/4 flat ..15 ft. 5c
Skein 50c
3/16 .....10 ft. 5c

RUBBER LUBRICANT

Large bottle ..10c

SANDPAPER

Doz. sheets.....5c

WIRE 2 ft. in 6-8-10-12-14

CELLULOID

6x8 .....5c
12 1/2x16 .....18c

PROP BLOCKS

1/2x 3/4x 5 6—5c
3/4x 3/4x 6 6—5c
1/2x1 x 7 4—5c
3/4x1 x 8 3—5c
3/4x1 1/4x10 3c-ea.
3/4x1 1/2x12 3c ea.
1 x1 1/2x12 4c ea.
1 x1 1/2x15 7c ea.

BUSHINGS

1/16 .....4 for 1c

BAMBOO

1/16 sq.x12, 36, 5c
1/16x1/4x15, dz. 10c

SHEET ALUM.

.0004x5x11 1/4 2-3c
.005 in. 6x6 5c
.010 in. 6x6 6c
.015 in. 6x6 8c
1/32 in. 6x6 15c

ALUM. TUBING

1/16, 3/32, 1/8, ft. 7c
3/16 or 1/4 ft. 10c

INSIGNIA

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$$(31.14) = \frac{(R.P.M.)\ A\ Cu}{40\ W^2}.$$

In this way corresponding values of (A) and (W) are obtained. When these points represented by the values of (A) and (W) are marked on the chart and a continuous curve drawn through them, the curve will be the one on the chart marked, *"Values of (A) and (W) for Estimated Maximum Performance. (Coef.* 31.14*)."* The significance of this curve lies in the fact that all airplanes will have the SAME high performance which have values of (A) and (W) represented by points on the curve.

If you will examine the chart you will see that the (31.14) coefficient curve passes to the right of the minimum practical wing loading line from a point represented by (A=3.4, W=2.65) to a point (A=10.5, W=4.5). Thus a plane, represented by a point lying between these two points on the (31.14) curve is not the lightest one that can be built and therefore would not give the greatest possible performance. The point on the graph that represents a plane that will give the maximum climb must lie on the minimum practical wing loading line and on the performance curve which touches this line at only one point. Obviously this is the point at which the curve is tangent to the line, or point (Y) on the graph. This tangent curve is the *maximum performance curve* and has a coefficient of (34.0). You will note that the estimated maximum performance determined through the scanning method is not far from the maximum curve (34.0).

Some of our readers will say now possibly that they can see that the values of (A) and (W) for their gas model should be the values indicated by the point (Y) or, Area=5.8 sq. ft. and Weight=3.45 lbs. It is true a plane with these specifications will give the greatest climb but not the best glide. Insomuch as the glide and sinking velocity has a lot to do with the duration of the flight, this must be considered.

Let us suppose that our gas model cannot be built with a wing loading less than 8 oz. per sq. ft. Then obviously the model with the lowest possible sinking velocity would be one with a wing loading of 8 oz. per sq. ft. The lightest plane that it will be possible to build due to structural considerations, must be represented by a point on the minimum practical wing loading line. The one point that lies on both lines is the point of their intersection, (X). Though this point lies to the right or below the maximum performance curve, the actual distance from the curve is so slight that very little reduction in performance will result. In fact the lower sinking velocity of a plane at point (X) will far outweigh in additional duration the loss in duration due to the very slightly lower rate of climb. Therefore the plane that will give the greatest possible performance will be one represented by point (X), having 7.16 square feet of wing area and weighing only 3.58 pounds.

From the system of scanning it was estimated that the best size for our gas model was 7 sq. ft. of wing area, and that it could be built as light as 4 pounds. This condition is represented by point (E) on the chart. The estimate of wing area was quite accurate as you can see, but actually it is possible to build the model to weigh less than the estimated 4 pounds.

It has been determined that the performance coefficient for estimated level flight with no possible climb, is 7.78. A curve plotted to this value of (F) will be the level flight or zero climb curve. It is shown on the chart and marked *"(A) and (W) values for level flight (Coef. 7.78)."* Planes represented by points on or below this line will not climb, or at most will climb only slightly.

The intermediate performance curves showing (A) and (W) values for rates of climb in hundreds of feet per minute were determined experimentally and checked by mathematical calculations for power required for level flight. Available power for climb was then determined and the climb for various ships calculated. The curves are laid out according to the findings. If you will check the climb that the curves specify for any plane you will find them quite accurate. At least they will serve to give comparative performance values.

One of the planes employed to check the accuracy of the climb curve values was the KG. The plane considered had a wing area of 10.5 sq. ft. and weighed 7 lbs. The climb of this ship was from 150 to 160 ft. per minute. This rate was determined from observing many flights over a period of two years. The rate of climb of many other planes of various proportions was found to check with the curve values also.

Now let us see what the graph can tell us about a gas model, the wing area and weight of which is known. As an example the characteristics of a model "Cub" will be used. This ship was recently built and tested in the presence of the author. He is therefore intimately familiar with the practical results.

The little ship was powered with a 1/6 hp. engine. However it will be assumed that a 1/5 hp. engine was used when determining the performance of the plane, as the graph shows results for 1/5 hp. motors. The wing area was five square feet and the weight was 3 1/4 lbs.

To determine the characteristics from the graph you should proceed as follows. First, find the 3 1/4 pound line on the scale at the bottom of the graph. Follow up this line vertically until you reach the intersection of this line and the horizontal (5) square feet line. This point is just below the point (Y) on the graph. Its position relative to the curved performance lines indicates the performance that might be expected from this model plane powered with a 1/5 hp. engine.

You will note that the point lies just a

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hair above the curve representing a climb of 600 feet per minute. However the model was actually powered with a 1/6 hp. engine and not a 1/5 one. The performance therefore would not be as great with the smaller engine as indicated on the graph. However the performance with the 1/5 hp. motor may be determined from the graph by means of the following formula:

$$X_A = \frac{AH}{P}.$$

In the formula (A) is the area of the model. In this case it is 5 sq. ft.; (H) is the power of the motor used, (1/6 hp.); (P) is the power of the motor for which the graph is laid out, and (X_A) is the new reading on the 3¼ pound line for "equivalent area." When the formula is solved, using these values, $X_A = (4.17)$. In other words, a plane with 1/5 hp. weighing 3¼ lbs., and having 4.17 sq. ft. of wing area will give the same rate of climb as one which has 1/6 hp., 5 sq. ft. of area and weighing 3¼ lbs. To find the new point (4.17), follow up the 3¼ lb. line to an area reading of (4.17). This point will be slightly below the curve for a climb of 500 ft. per minute. The exact reading will indicate a climb of 475 ft. per minute. This value checks accurately with the actual performance of the "Cub."

By means of the formula given above the performance of any plane with any amount of power may be determined.

Normally the KG with 1/5 hp. has a climb of about 200 ft. per minute. With a 2/5 hp. motor, such as the Forster Brothers engine, it will have a climb of about 650 ft. per minute.

Next month the final size and proportions for our high performance gas model will be established in the light of the information given by the performance chart.

NOTE—CORRECTION

In the article of this series which appeared in the April issue, three numerical mistakes were made. On page 63 the figure 4 lbs. which appears in the middle column 2½ inches from the top of the page should read 4.5 lbs. In the denominator in the formula which appears just below it, the figure 16 should be 20.25. About three inches below this formula and just above the second formula, the figure 4.0 lbs. should read 4.5 lbs.

In the center column, page 62, of this same article, a formula for the correct number of rubber strands to use for a motor was given. A better formula and one which is believed to be more accurate has been developed through additional experimentation. It is as follows:

$$N = K\left(\frac{WP}{\sqrt{A}}\right)\sqrt[3]{\frac{D^2}{a}}.$$

The following are the correct values of K for various degrees of power. *For double surface wings;* low climb, K=0.8; medium low, K=0.95; medium high, K=1.10; high climb, K=1.3. *When single surface wings are used;* low climb K=0.92; medium low, K=1.08; medium high, K=1.25; high climb, K=1.47. The meanings of the symbols are given in article No. 75, April issue.

Frontiers of Aviation

(Continued from page 15)

profitable enterprise for a racing pilot to get one, for over $102,000 will be given away in prizes at this year's National Air Races. Earl Ortman's Kieth Rider racer is now stored at Union Air Terminal in Burbank with a new paint job of tan with black trimmings and may again be prepared for the 1938 National Air Races. Some new Folkerts may also make their appearance later in the year.

While this wooden mania goes on, Mr. Donald Luscombe has been doing great things with metal. Specifications of his two latest airplanes are as follows:

	Luscombe 90	*Luscombe 50*
Wingspread	32 ft.	34' 6"
Length	20' 11¼"	19' 4"
Height	6' 6"	5' 7½"
Top speed	130 m.p.h.	106 m.p.h.
Cruising speed	115 m.p.h.	94 m.p.h.
Wing loading	12.3 lb./sq. ft.	8.0 lb./sq. ft.
Power loading	19.1 lb./hp.	22.2 lb./hp.
Weight empty	1,100 lb.	630 lb.
Gross weight	1,725 lb.	1,110 lb.

Both airplanes have all-metal fuselages with fabric-covered wings. They are both high-wing, strut braced monoplanes with full cantilever landing gears. The Luscombe 90 has a 90 hp. Warner engine and the Luscombe 50, a 50 hp. Continental engine. The latter will compete directly with Taylorcraft, Aeronca and Piper (the new name for the Taylor Aircraft Co.). The new 50 hp. Lycoming and Menasco four-

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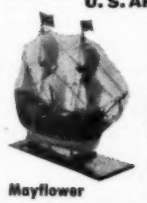

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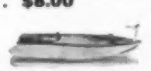

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cylinder, opposed, engines that have been put on the market will undoubtedly power the Luscombe 50 also. Incidentally, by the time this is read Menasco may have its A.T.C. approval on their latest midget product. Already Aeronca has ordered 500 of the engines!

Piper will soon come out with another new light plane which is said to have side-by-side seating instead of tandem fashion as on present Cub models.

The author recently stopped in at the Bellanca factory, which is splendidly situated on the banks of the Delaware at New Castle, and saw their new low-wing, three-place airplane which sells for the low price of $3,150. One really gets their money's worth in that airplane because its average speeds are up to 130 m.p.h. with a cruising range of 500 miles on either 70 or 90 hp. Le Blond engines! The landing gear is retractable, the fuselage is steel tubing fabric-covered, and the wing is of two spar wood construction. The wing is similar to the Bellanca single-engined racer except, of course, that it is smaller and full cantilever. Tests have been very successful with the first airplane, and the jigs were all set up and the second ship was already in production when the visit was made.

It might be remembered several years back of the famous Alexander "Bullet" designed by Mr. Mooney who later designed his own airplane along the same lines. Mr. Mooney was later with Bellanca and presently with Lambert. Generally speaking the new Bellanca is the same type of airplane as the Bullet and the Mooney ship. Specifications of the Bellanca 70 and 90, both called officially the Bellanca Junior, are as follows:

	Bellanca 70	*Bellanca 90*
Span	34′ 2″	same
Length	21′ 2″	same
Height	6′ 3″	same
Top speed	132 m.p.h.	115 m.p.h.
Cruising speed	120 m.p.h.	105 m.p.h.
Landing speed	45 m.p.h.	45 m.p.h.
Gross weight	1,650 lb.	1,650 lb.
Weight empty	943 lb.	912 lb.
Wing loading	11¼ lb./sq. ft.	same
Power loading	18.3 lb./hp.	23.5 lb./hp.

Two Bellanca Skyrockets were nearing completion at the time of the visit. One was a special Navy ship to be equipped for radio control and blind flying. It will be one of the Navy's flying radio laboratories.

In the experimental hangar was housed the three-engined Bellanca racer built for Alexis Papana. During test flights the airplane was found to have a cruising range of 4,200 miles. However, the company is expecting to get 5,000 miles out of it. Other Bellanca models are undoubtedly on the boards and perhaps some military work in the offing.

We also dropped in at Wichita after a speedy trip across the continent to visit the many aircraft plants there, such as Beechcraft, Cessna and Stearman. Cessna's new product is the Airmaster, an improved version of former Cessnas. Ten inches have been added to the tread of the landing gear. The full cantilever landing gear flares out at the fuselage slightly instead of going straight down at an angle. Between the landing gear panels is a new "belly" flap which is said to work exceedingly well. The landing gear "cups" the air as it hits the flap and thus slower landing speeds are obtained. A brake has been put on the tail wheel and the tail itself has been redesigned. Many of the efficient little monoplanes were under construction in Cessna's moderately-sized plant.

In one corner of the plant was stored the dies and molds for building the Longren all-metal biplane and perhaps someday we may see an all-metal Cessna.

The new Fleetwings all-steel Seabird has been "cleaned up" considerably with a more pointed bow and several are reported to be on the production line now. Fleetwings is said to have built a stainless steel wing for a Northrop as well as a Seversky.

Grumman likewise has made some slight alterations in their twin-engined amphibian and in the meantime we await the results of Navy tests on their new mid-wing fighter.

The new Martin flying boats being built for the Navy will be gull-winged. While they are only in the very earliest stages of construction it is said that Martin, Sikorsky and Boeing are figuring on 60-ton flying boats for the Navy.

In the meantime Allison has been developing a new engine for giant airplanes and it is without doubt that the Army will be the first to use it. The engine will produce about 2,000 hp! We have heard that a Hawker Hurricane recently averaged approximately 409 m.p.h. on a short hop in England. (This was done with a 50 m.p.h. tail wind. Editor)

Bids on the Lockheed 14 and Douglas DC-3 Army transports are as follows: Douglas bids ranged from $139,425 to $275,000 in lots of one; $47,485 to $70,050 in lots of 100. Lockheed bids ranged from $224,865 to $240,955 in lots of one; $65,749 to $81,839 in lots of 100.

It is said that the Lockheed Company once more has an A.T.C. on their Model 14 after the ill-fated crash of one of their ships on Northwest Airlines. Dynamic balances were put in the tail surfaces to prevent flutter on their standard models. Before dynamic balances, it is said, were not standard equipment though K.L.M. ordered it on the Lockheed 14s they ordered. The first K.L.M. Model 14 has been housed during tests in Howard Hughes' new hangar that he has just rented at Grand Central Air Terminal and where he now keeps his big

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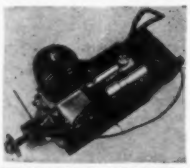

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Douglas DC-1 which may go on a long flight soon.

K.L.M. are using full feathering Curtiss propellers on their new Douglas DC-3 transports. Hamilton has just come out with a full feathering propeller to keep up in the competition.

The big news in the commercial field, however, is that United Airlines may spend $6,000,000 for 25 new four-engined transports this year! Whether they will be Curtiss, Boeing or Douglas we do not know as yet. The Douglas DC-4 is rapidly nearing completion, and it will definitely have a super-charged cabin for high flying. Costing $1,500,000 to date to build, the airplane will have a total of 5,600 hp. and with only three engines running it would still be able to surpass the highest mountain in the United States by 5,000 feet! Though large in size it is said that the big plane will be easily maneuverable in small fields because of the surplus in power.

The Boeing four-engined flying boat has been taken out of the plant and test flights will be conducted soon. T.W.A. has approved the mock-up of the Boeing four-engined land transports and production is now under way with them.

In England the Armstrong-Whitworth Ensign four-engined transport has made its maiden voyage as has the Mayo Composite Aircraft. The Mercury lifted off its mother ship, the Maia, with undue success they tell us.

Other English planes to be test hopped are the new Percival "Q" twin-engined sportplane, the DeHavilland Albatross with a new tail, and the latest Vickers-Wellington bomber. The tail of the Albatross has been cleaned up considerably and conforms more adequately with the beautiful lines of the airplane. The rudders have been placed further out near the tips of the horizontal tail where they should be.

The Timm 840 transport has now been test hopped with none other than Vance Breese at the controls. The ship showed a very surprising high speed as it streaked down the field in its first time off the ground. Mr. Breese purposely stalled the plane after circling the field once or twice to test the Handley Page slots and flaps. The airplane seemed to "hang" still in the air and did not "fall off" on one wing.

At Cleveland it is reported that a flying wing airplane has been under test and others built or in the process of construction are the Wendt two-place high wing monoplane, a Miller low-wing sport plane similar to Brown racing ships and designed by Mr. Miller who designed the Q.E.D. and Hawks racers, a small parasol two-place flying boat known as the Trimcraft, a Johansen JA-2 low-wing monoplane with a 40 hp. engine, and a clean cut White amphibian pusher carrying three people. Bill Ong's new airplane is somewhat similar to Benny Howard's sportplane but smaller. Pitcairn is still doing development work with their roadable autogyro and Hawley Bowlus is busy with his all-metal sailplanes. Lambert has sold the designs of their Monoprep to the Dart Manufacturing Co. Watch for more details on the above planes in the near future.

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300 Young men are enrolled now at CURTISS-WRIGHT TECH training for their future

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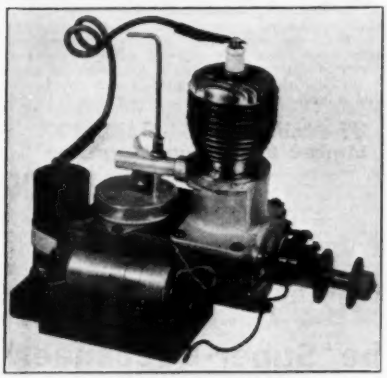

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Boys! If you want a plane you can depend on, build this gas job. The above cut shows two unretouched views of this dependable and consistent flyer. The Special has a smooth, graceful glide too.

Kit consists of cut-out ribs, bulkheads and stamped formers. Plenty of wood, cement, etc., to complete plane. Large, full-size plans included.
Kit complete (less motor, timer or airwheels).....$5.50
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THE "BAT" MOTOR

Weight 4½ ounces (⅝" bore).
Block and crank case aluminum castings (permanent mold.)
"Vanasil" pistons, rings and connecting rod. Lighter than aluminum.
Fine permanent compression makes easy starting.
Runs upright or inverted.
Flies models 3 lbs., 6 foot span.
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A "BAT" improves with use.

Build a Model of the Martin 166 Export Bomber

This plane is the latest bomber creation by Glenn L. Martin and is adopted from the Army bombers we now use in our own air force. The Model 166 has been developed for the sub-stratosphere. The following table is a key to the interior view of the bomber on the accompanying plans.

A—Machine-gun
B—Gunner
C—Oxygen tanks (for sub-stratosphere flying)
D—Instrument board
E—Pilot
F—Bomb door lever
G—Maps
H—Bombs
J—Radio compass
K—Radio operator
L—Ammunition racks
M—Life raft
N—Parachute flares
O—Signal flares
P—Aircraft signal pistol
Q—Gunner's floor

Use balsa wood in building the model which may be obtained from any model supply company advertised in this magazine. Be sure to get their best grade of balsa. If you wish to build your model other than to the size of the plans, the plans may be photostated to the required size. For easier measuring the plans may be squared off by joining the corresponding dashes on the border. Each square will equal one sq. ft.

Make the fuselage first. Draw the outline of the top view on stock with the grain of the wood running lengthwise and cut with a jigsaw. Go over the sides with coarse sandpaper and then draw the outline of the side in correct position and cut again. Round out the fuselage as shown by the cross-sections with chisel and razor.

Next draw the outline of the wing panels and cut to shape with saw. Then taper them down with a sharp flat chisel as shown in front view of model on plans. Referring to the airfoil sections, shave down the wing as shown. Go over both right and left wing panels with coarse and then fine sandpaper and do likewise with the fuselage. Shape out the engine nacelles and tail units in the same manner. Cut grooves in the leading edge of the wing to fit the nacelles.

Be careful and take plenty of time for it is accuracy and neatness which counts most in building a model. The wheels for the landing gear may be purchased or made and a combination of wire and wood may be used in constructing the landing gear. After all parts have been made, go over them with fine sandpaper until their surfaces are very smooth and then begin the assembly.

Lay the fuselage in flying position on a flat surface and join the wing panels to the sides with plenty of model cement. Connect up the tail surfaces and put blocks under all to hold them in place. Put the nacelles and cowls in the wing, applying sufficient cement. While waiting for the connections to dry shape out two three-bladed propellers. Make the blades separately and cement them to central hubs. They may be joined to the nacelles with straight pins. Install the landing gear next and then go over the entire model with fine sandpaper. Putty may then be used in filling all cracks and making wing fillets.

The plane should be painted copper color with the red and white insignia of the Turkish government as shown on plans. Many coats will have to be applied until a smooth finish is obtained.

N.A.A. Junior News

(Continued from page 25)

with the rules. Carry a copy for reference.

Do not allow anyone within the launching or starting area except officials and the contestants who are actually flying.

Keep the contestants near their own judging group and keep a clear space for them and their models, so that the press of spectators will not interfere with their preparations.

Set up the outdoor launching platform at the windward end of the flying field, and be prepared to move it if the wind shifts. The launching platform need be no longer than about seven by four feet, and constructed of ordinary boards. It should be on the ground and level.

Do not permit newspaper reporters or photographers to bother the contestants until they are finished with their official flights. It is a favorite stunt of the photographers to get the boys to line up with their models for a picture of the planes in flight before the contest. This often results in many wrecked models and disappointments.

Use plenty of officials, let the meet proceed carefully, leisurely and orderly.

Note that it is possible for a contestant to have a total of nine delayed flights, which in themselves constitute the limit of official flights permissible. Do not permit any contestant to have more than the nine delayed flights, even though he does not succeed in getting a good flight. Such special privilege, if granted, would not be fair to the other contestants who were able to get in their official flights within the allowed number of trials.

Exchange Clubs Sponsor 1938 National Meet

The Detroit Exchange Council, under the able leadership of Squire Eurich, is already actively at work on Detroit arrangements for this year's National Championship Model Meet. An initial meeting was held at Detroit on January 28 attended by members of the aviation committee of the Detroit Exchange Council, Irwin Polk, business manager of the 1939 meet, W. R. Enyart, Secretary of the N.A.A., Mr. A. Vhay of the recreational department of the City of Detroit, and a delegation from the national office of the Exchange Clubs headed by Mr. Harter, National Secretary of the Exchange, and Roland Bixler, editor of the Exchangite.

It was announced that the Detroit Exchange Council is sponsoring a meet underwriting drive and have established a $4,000 underwriting quota. Details were worked out whereby the national office of Exchange will encourage the sponsorship by local Exchange clubs throughout the country of model meets which offer a free trip to the Detroit Nationals for the winner. Between 700 and 800 local clubs are members of the National Exchange organization. The Detroit Council comprises 12 Exchange clubs in the Detroit area.

Draft rules and regulations for the 1938 Nationals are being prepared by the Academy of Model Aeronautics for presentation and discussion at the First National Model Convention. Opportunity will be given all model builders to make

suggestions regarding the proposed rules, which will be officially adopted at the conference.

Formal presentation of the official sanction certificate of the N.A.A. Contest Board was made at the meeting to Mr. Eurich, representing the Detroit Exchange Council by Mr. Enyart.

Scheduled Contests

March 5—The Junior Aviation League will hold the monthly microfilm contest at the South Armory under the direction of Munnick, Lewis, and Brown.

March 12—The Philadelphia Model Aeroplane Association will hold a Junior division meet in their annual series of P. M. A. A. Indoor Meets at 108 Field Artillery Armory under the direction of Victor R. Fritz.

March 12—The Quaker City Gas Model Association will hold a monthly meet at the Northeast Philadelphia Airport under the direction of William S. Berry.

March 19—The Junior Aviation League will hold their monthly glider meets at the South Armory under the direction of Munnick, Lewis and Brown.

March 29—The Philadelphia Model Aeroplane Association will hold a Senior Division meet in their annual series of P. M. A. A. Indoor Meets at 108 Field Artillery Armory under the direction of Victor R. Fritz.

CHAPTER NEWS

The Birmingham Model Airplane Club, under the joint sponsorship of J. Blach & Sons and Radio Station WSGN held another indoor meet in the Municipal Auditorium on Sunday January 9th. The meet was one of a series being held indoors in the spacious auditorium, which seats over 5,000 persons, and was a huge success.

Practically the entire membership of over 200 boys of the Birmingham Model Airplane Club attended and entered the various events. The Class "A" Indoor Glider Event drew a number of entries paced by the winner, Jack Mixon, with a record of 27.1. This was just shy of the Alabama State Record of 27.1. The speed event was by far the most exciting. Although no official timing apparatus was available to clock the events, it was the first ever held and the boys showed much interest. One flight of the model built by Norman Gilbert was judged to have surpassed the 65-mile-an-hour speed over the short course.

The meet started at 2:00 P.M. and lasted for several hours. One full half hour was broadcast over WSGN by Bob McRaney, who was recently elected Senior Advisor and Official Contest Director, and who also represents The National Aeronautic Association. McRaney has been very instrumental in the development of the club and the broadcasts have proved a great advantage to the club in its drive for recognition and membership. The group recently received its charter from N.A.A., making it an official junior chapter.

Birmingham is making its bid for national recognition and it is expected that some new Southern records will be established during the coming season. Merchants and Civic organizations have donated a number of valuable trophies and awards for each meet, and as a result interest has been very high.

We welcome four new junior chapters to the N.A.A. this month. The Kazoo Junior Chapter in Kalamazoo is one of the most active. Already plans are being laid for a model meet which will include Southwestern Michigan, and indications are that it will be a spirited contest. L. J. Tooley is the Senior Advisor.

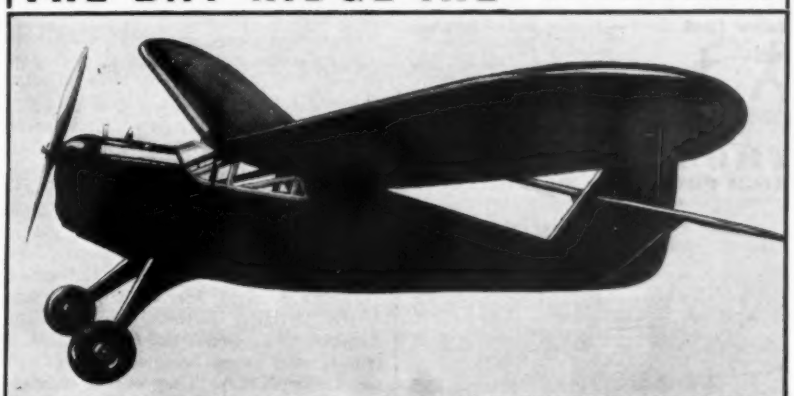
Then we have another new chapter in Wyoming. They have started out with ten good men and true, and we hope to hear they have been qualifying themselves as nationally known flyers.

And from the South: a new chapter in Portsmouth, Virginia, and another in Shreveport, Louisiana. The south is coming along with their model flying. They will probably make things lively at the Nationals.

A major triumph for the Richmond News Leader Junior Chapter came with the news that one of its members, John W. Martin, had won second prize in the nation-wide contest in Chicago under the sponsorship of the International Air Show organization. John entered a solid scale model of an Army P-26-A fighter.

The Linden Model Aircraft Club is a good example of how a group can keep

THE BAY RIDGE IKE — 6 FT. GAS MODEL



The true actual photo shows you how beautiful the ship looks. It is completely streamlined leaving no parts of the engine exposed. Many new features are found on the plane, such as: needle valve extension, single leg landing gear, raised tail surfaces and inverted engine which also can be mounted upright.

Kit is neatly packed in an attractive box with cut out ribs, shaped propeller, large cans of cement, dope, wire, aluminum sheet, celluloid, screws, nails, balsa wood strips cut to size and many other parts to complete the model.

Complete Kit (except air wheels)....$3.95 P.P.
Deluxe Kit with air wheels and colored dope....6.50 P.P.
Full size plans....50c P.P.
Special offer. The New Brown Junior engine (with piston rings) and our deluxe kit....$22.50 P.P.

C. O. D. Orders Filled

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FREE with every order of $1.00 or over we will give 1 pint of cement and free postage in U.S.A.

BALSA
5 Ft. Lengths
1/16x3/4 ..4 for .10
1/8x1/2 ..3 for .14
1/8x1 ..2 for .15
3/16x3/16 ..... 8 for .25
3/16x1/2 ..... 2 for .10
3/16x1 2 for .19
1/4x1/2 ..6 for .25
1/4x1/4 ..4 for .25
1/4x1 ....3 for .25
3/8x3/8 ....2 for .25
3/8x1/2 ....3 for .27
1/2x1 ....1 for .18
1x1 ....1 for .25
BAMBOO PAPER
24x36 ..each .05

GAS MODEL BALSA
36" or 18" length of gas model balsa can be had. See our regular list of model supplies below Please mention its use.

SHEET BALSA
5 Ft. Lengths
1/32x2 2 for .15
1/16x2 2 for .17
3/32x2 2 for .20
1/8x2 ....2 for .23
1/16x3 ....2 for .27
1/4x2 ....2 for .30
1/2x2 ....2 for .25
Double the 2" price for 3" widths.

HARD ALUMINUM SHEET
1/16x3x12.. .25
1/32x3x12.. .15

COVERING SILK
1 Yd. 36x36.. .45

AIRCRAFT SPRUCE
5 Ft. Lengths
1/4x3/16 ..... 1 for .04
2 1/4x1/4 ..... 1 for .05
3/16x3/16 ..... 1 for .07
3/16x1/2 ..... 1 for .10
3/16x1.. 1 for .15
3/16x3.. 1 for .40
1/4x1/4 ..... 1 for .09
1/4x1/2 ..... 1 for .14
1/4x1 ..... 1 for .17
1/4x3 ..... 1 for .45

HARD ALUMINUM ANGLE
1/8x1/2 per ft. .15

M & M AIR WHEELS
3 1/2" pr.....$1.50
3 1/2" pr..... 2.50
4 1/2" pr..... 2.75

OHLSSON AIR WHEELS
3 1/2" pr.....$1.50
4 1/2" pr..... 1.75

Gas Model Cement
Clear Dope
Colored Dope and Thinner
1/4 pint can.. .35
1 pint can.....60

GAS MODEL PROPS
12" ..... .45
13" ..... .75
14" ..... .75
16" $1.00

MODEL AERONAUTICS YEAR BOOK
This book contains more than 80 detail plans of both gas and rubber powered models.
Price $1.00 P.P.

ALUMINUM RIVETS
1/8" dia. doz .05
STEEL MUSIC WIRE
5 Ft. Lengths
1/16 dia..... .10
3/32 dia..... .15
1/8 dia..... .25
SHEET CELLULOID
6x10 each.... .07
REED
1/4" dia. ft.... .03
1/8" dia. ft.... .02
MIDGET FIRE-CRACKER COIL
Suitable for any type of engine. Wt. 2 oz. Each $2.50 P.P.
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Easy to install can be regulated from 1 to 45 seconds. Each $1.75 P.P.

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18" lengths
1/16x1/16 ..... 30 for .05
1/16x1/8 ..... 25 for .05
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3/32x3/32 ..... 30 for .05
3/32x1/4 ..... 16 for .05
1/8x1/4 30 for .05
1/8x3/16 ..... 14 for .05
1/8x1/4..12 for .05
3/16x3/16 ..... 8 for .05
1/4x1/4 6 for .05
1/4x3/8 4 for .05
1/4x1/2 4 for .05
1/4x1/2 2 for .05

18" Sheets
1/32x2 6 for .09
1/16x2 6 for .10
3/32x2 6 for .12
1/8x2 6 for .13
3/16x2 3 for .09
1/4x2 3 for .10
1/2x2 2 for .10

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1/2x3/4x6 ..... 4 for .05
3/8x1x7 3 for .05
3/4x1x8 2 for .05
3/4x1 1/4x10 ..... 1 for .04
1x1 1/4x12 ..... 1 for .06
1x2x18 1 for .12
2x2x18 1 for .20
1 1/4x2x18 ..... 1 for .15
1 1/2x2x18 ..... 1 for .18

BALSA PLANK
18" lengths
1x1..... 1 for .05
1x3..... 1 for .15
2x6..... 1 for .45
3x6..... for .68
Wood can be had in 36" lengths or 3" widths by doubling the 18" price. We also cut special sizes. Send in for prices.

CEMENT, CLEAR DOPE, THINNER AND COLORED DOPE
4 oz.....20
1/2 pint 8 oz....35
1 pint 16 oz. .60

WHEELS PER PR.
Size Bres.
1/2" .01
3/4" .02
1" .03
1 1/4" .04
1 1/2" .07
2" .09
2 1/2" .10
FREE bushings with balsa wheels.

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1/16 flat ..... 20 ft. .05
1/8 flat 17 ft. .06
3/16 flat ..... 12 ft. .07

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1/16x1/4x15 ..... 6 for .05

1/16x12" round bamboo 6 for .04
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1/16 dia. 3 ft. ..... .02
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DOWELS
1/16 dia. x 12 doz..... .05
1/8 dia. 18" 4 for 03

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1/16 dia. per ft..... .07
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3/16 dia. per ft..... .10
1/4 dia. per ft..... .12

SHEET ALUMINUM
010..... 6x6.....06
12x12....20

DUMMY RADIAL ENGINES
1 1/2" 10
2" 15
3" 25

BALL BEARING PROP. SHAFT
1/16" dia. shaft ..... .35

INSIGNIA
Sheet containing 4 sets of American, French, English and German.
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All colors 3 for..... .05

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Light and Strong for rubber power models.
All Colors 18x20"
1 Sheet..... .03
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5" ..... .05
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MODEL KNIFE
1 for..... .10
Extra blades 3 for..... .10

THRUST BEARINGS
Small per doz .10
Large per doz..... .15

CELLULOID SHEET
4x5 ..... .03
Model pins per pk..... .05
Dope brushes small ..... .03
large ..... .05
Nose plugs each ..... .01

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Small or large, doz. ..... .01

Ordering Instructions
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THE ONLY MOTOR USING ROLLER-BEARINGS!

WILL outperform and outwear any motor of its size on the market. TROJAN MOTORS are used by all LEADING model builders. **WE INVITE COMPARISON**

See your dealer or write for folder. Shipped with coil and prop—ready to run..... **$18.50**

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6826 Sunset Blvd., Hollywood, Calif.

NEW TRUE SCALE ORNAMENTAL MODELS

Photograph of the Boeing P-12-E Model

BEAUTIFUL ½" & ¼" to 1' Scale, TRUE TO SCALE REPRODUCTIONS.

U. S. Army Curtiss Hawk P-6-E. **U. S. Navy Curtiss Goshawk**
U. S. Army Boeing P-12-E. **U. S. Navy Boeing F4B4**

UNUSUALLY COMPLETE CONSTRUCTION KITS are now available at AMAZINGLY LOW INTRODUCTORY PRICES. ALSO SPECIAL FINISHING KIT to finish these models in a most professional manner.

We are now offering SPECIAL COMBINATIONS of our Construction Kits and Finishing Kit at most unusual savings over the regular prices. Here is a real bargain that you just can't afford to miss.

Send 5c promptly for DETAILED DESCRIPTIVE LITERATURE giving detailed and illustrated description of the models, Construction Kits and Finishing Kit. Also prices and full information on the Special Combinations. Actual photograph of a Finished True Scale Ornamental Model, only 10c additional.

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Quality Model Aircraft & Novelties
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5ft.----MR. MULLIGAN

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COMPLETE 60 Inch

Guaranteed Giant Flyer

Contains a large TURNED Nose, Finished propeller, Extra large bottle of cement and dope, 3" wheels, big bundle of strips, printed sheets, large sheets of tissue, and plenty of extras to build this Giant Flyer.

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Write to us for the amazing low discounts we are prepared to offer you on this unexcelled giant flyer. Please write in on your letterhead.

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Our wholesale list of supplies and kits are waiting to hear from you. We feel sure that you can use this list to your advantage. Write at once for your copy.

CAPITOL AIRCRAFT SUPPLIES CO.
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298 Rogers Ave. Brooklyn, New York

on its toes. Local competition is keen and plentiful, and their bulletin, The Gasett, helps keep it that way.

From the sunny shores of California comes the cheering news that a charter chapter is being organized. How do some of you Easterners feel about those thermals? Wish you had a few? There are a great many gas model clubs around San Fernando, but all of them are independent. They should be introduced to our Air Youth Program. If you would be interested in helping form a chapter, get in touch with Mr. Frank H. Chaussee, 1204 Porter Street, San Fernando, California.

Edwin S. Saul, secretary of the Gas Model Division of the Syracuse Model Airplane Club, writes that his I.G.M.A.A. unit is anxious to become affiliated with the Junior N.A.A. They expect to apply for their charter in the near future. Their director, Harry C. Copeland, writes with news of some of their recent activities:

"On Friday evening, February 11, a group of our boys went to Sidney, N. Y., to stage a demonstration of indoor flying models at the High School. This was a mass meeting planned by the Sidney Exchange Club. We showed movies of Syracuse Air Show of 1937, and gave the audience flying demonstrations of indoor stick, fuselage, and flying scale models." Two other New York cities, Binghamton and Sidney, plan to form Junior N.A.A. Chapters shortly. More power to all of you!

Rocco S. Glorioso, Contest Director for the Teche Junior Chapter in St. Louis, sends us a newspaper clipping which says in part: "This year the boys of the Teche Junior Chapter are preparing themselves to enter not only the rubber-powered events, but also the gas-powered events. Last year the boys concentrated on the building and flying of the scale model planes, and covered themselves with glory in this event. This year they not only will repeat in the scale event, but will give the other entries a fight for the top honors in the other events." It would seem as though this bunch meant business!

"FATHERS' GROUP" FOR MODEL CLUBS SUGGESTED

L. B. Bush, former secretary of the Executive Committee of the I. G. M. A. A., has sent us the following organization set-up, which we endorse for study and possible adoption:

"Unit 75 of the I. G. M. A. A., Omaha, Nebraska, has for the past year been sponsored by a father's group known as the Executive Committee of this organization. The fathers have interested themselves to the extent of getting behind the Gas Model building program, and informing the Executive Committee did so primarily to show the public that the fathers of the boys belonging to this Club were vitally interested in seeing that their boys carried out this program from a safety and educational standpoint.

"The Executive Committee consists of five fathers selected from the fathers of all the members and have regular meetings at which times suggestions are brought up which are in turn placed before the Unit 75, organization themselves. Some of the suggestions have been the control of crowds when the boys are flying their planes, the proper safeguards in building their planes which are inspected at regular intervals by this Executive Committee, and during the epidemic of Poliomyelitis in Omaha last year rather than have the boys congregate so that crowds would accumulate around them while flying, we selected a field located out of the city area several miles which was not public and away from any place where crowds would congregate. This is some of the ways we have endeavored to protect gas model building in Omaha.

"There are several points that we would like to clear up and some suggestions that we would like to make to further the movement: First of all, we notice that you are placing an age limit on the boys joining N.A.A. In our group there are several boys that are under this age limit and we feel that placing the age limit at 16 is placing a hardship on many boys that we are trying to reach. For instance, we are trying to keep the boys from 12 to 18 and over interested in something that will keep them from the streets and out of bad environment. Now if this movement places an age limit of 16 years these boys that are interested will be prevented from joining the N.A.A. which should not be. We believe that your age limit should include boys as low as 12, and we suggest that in your new set up that you formulate a definite set of rules for each Unit to follow. You are not only trying to promote gas model building, but character building. If this organization can draw up a unified set of rules under which each Unit is to function, and have each Unit supervised or sponsored by an adult Club, such as Unit 75 has, we believe that you will find all of the Units throughout the United States functioning to an even greater extent than in the past.

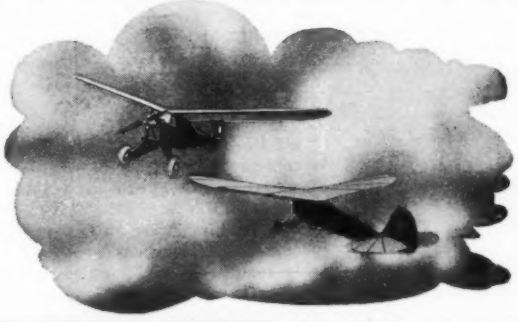
"We believe that there should be a requirement that each Unit be sponsored by an adult Committee, as all boys that are flying Gas Model planes are minors and are placing their parents in a position where they are responsible for damage without the parents having anything to say about what takes place. Further, one of the great difficulties of raising boys today is the fact that so many movements draw the boys away from the fathers. The Gas Model building should draw them very much closer together, and by placing a committee of fathers to sponsor these gas model clubs, it would not only bring the boys closer to their fathers, but give supervision as well from the parents who are most vitally interested after all.

"We are making these suggestions to you and would like to hear from you regarding them. The boys in our Unit are ready to join N.A.A. and we would like to have you send us the particulars and advise us on one particular point. Are all of the present I.G.M.A.A. members qualified to join N.A.A. regardless of age limit. As stated before, some of the members of Unit 75 are not 16 years of age and the Unit wants to join together. We would like to have this point cleared up if possible before any of them join N.A.A. We feel that your movement is one to be commended and the writer as

"Flying High all over the U.S."

HEATHE'S NEW AND MIGHTY

Miss EMPIRE STATE



MASTER SET $5.00 COMPLETE without motor. Plus 50c postage with all parts as specified.

DELUXE SET $9.95 COMPLETE without motor. Plus 75c postage with all parts as specified plus: Carved Prop, Cut-out Ribs, two—½ pts. of colored Dope, 4 yds. Silk Tips and Jacks, 3½" Air Wheels, Landing Gear Brackets, Gas Filter Funnel, Turned Aluminum Prop Spinner.

WINGSPAN—7 feet 9 inches

WEIGHT—3¾ lbs complete with motor and gas

Power Miss EMPIRE STATE with any standard miniature engine for the thrill of powered flight.

It's got everything you look for in a Gas Model Plane! A better plane for less money. It is the result of seven years development in the building of model planes. Proved in championship competition. Miss EMPIRE STATE is your assurance of championship performance. Simple to build—fun to fly—sturdy in construction—will give you a lot of real satisfaction!

THIS SENSATIONAL SET FEATURES: All Balsa Construction—Monospar Wing—Recessed Ribs—Ready-made Tubular Battery Case—Illustrated Instructions for Installing Flight Timer—Variable Angle of Incidence—Diagram for Installing Ignition System—Diagram for Installing Engine—Balsa Wood Fuselage Framework—Landing Gear Struts ⅛" Wire—Adjustable Rudder—Cement—Dope—Bamboo Paper—High Thrust Line—Pattern for both halves of wing—Shock Absorbing Landing Gear—Detachable Wing and Tail Assembly—Removable Engine Cowl—Full size copyrighted Plans and Instructions. Hard-wood wheels—New Skid Slide Safety Motor Mount. Prop Blank—Knife Switch—Nuts and Bolts—Screws—Everything complete and over!

HEATHE MODEL AIRPLANE COMPANY 260-M5 Troy Ave., Brooklyn, N. Y.

SENSATIONAL MOTOR VALUES!!

$10.00 Complete

BROWN JR MOTOR

SPECIFICATIONS—ON ALL MOTORS

Each model contains the following improved parts: SPARK PLUG: Newly designed with concentrated spark. CRANK-CASE: Newly designed, extra strength die cast aluminum silicon alloy with high speed bronze bearing. TIMER: Improved tension spring with tungsten contact points. FUEL TANK: New type, two piece, detachable for cleaning. SPARK COIL: Water proof, oil proof, gas proof.
Each model has the original specifications, viz: ⅞" Bore, 1" Stroke, Approximately ⅓ Horsepower, 1,200 to 10,000 R.P.M.

ADDED FEATURES:

MODEL—B $21.50 Cadmium plated to give lustrous finish. PISTON: Hardened steel, ground and lapped to fit. CARBURETOR: Micrometer type needle valve control. Packed completely mounted ready to run. Tested & guaranteed.

MODEL—CV $17.00 Cadmium plated to give lustrous finish. PISTON: Aluminum alloy with 2 special rings. CARBURETOR: Simplified pin type control. Packed completely mounted ready to run. Tested & guaranteed.

BROWN MODEL—D $10.00

PISTON: Aluminum Alloy with 2 special rings. CARBURETOR: Pin type simplified control. CRANKSHAFT: Specially designed counter-balanced Z-metal. Packed complete ready for mounting, tested & guaranteed.

SYNCRO ACE	$15.00
TROJAN, Jr.	$18.50
BUNCH WARRIOR MOTOR, complete	$12.00
OHLSSON	$18.50
CHUM "Chum"	$17.75
HUSKY, Jr.	$12.50

GWIN AERO KIT	$11.38
MIGHTY MIDGET KIT	$0.85

HEATHE GAS MODEL SUPPLIES BUILD BETTER MODELS AND SAVE MONEY!!

LUMBER GAS MODELS—ALL FIVE FOOT LENGTHS

The following wood can be had in Spruce, Bass, or Balsa at the same prices as those listed below.

⅛x⅛	$ .03
⅛x¼	.03
⅛x½	.07
3/16x3/16	.04
3/16x⅜	.05
3/16x½	.07
3/16x1	.08
¼x¼	.05
¼x½	.06
¼x1	.10
⅜x⅜	.09
½x½	.10
½x1	.18
1x1	.25

REED

⅛", 3 ft. for .05
3/16, 3 ft. for .07
¼", 3 ft. for .10

BIRCH DOWELS 36" Lengths

3/16 dia. .04
¼ dia. .05

SPUN ALUMINUM WHEELS

5" dia. per pair only $1.50

SHEET BALSA (Special for Gas Models) 36" Lengths

1/16x2	.04
1/16x3	.06
3/32x2	.05
3/32x3	.09
⅛x2	.08
⅛x3	.09
3/16x2	.07
3/16x3	.11
¼x2	.09
¼x3	.15
½x2	.18
½x3	.30

For Five Foot Lengths in Sheet Balsa, Double Three Foot Length price.

GAS MODEL WHEELS

Special pneumatic wheels good for gas model from 3' to 8'. Size 3½". Price pair $1.50

Carved Props for any Motor, each only $1.00

BAMBOO PAPER 24"x36" sheet .08

SHAPED PROPELLER BLANKS Specify size of prop and Motor, each only .25

TOGGLE (ON-OFF) SWITCHES 45c

MINIATURE KNIFE SWITCHES

2 poles .25c each
3 poles .35c each

SPRING STEEL WIRE (In 5-foot lengths)

1/16 dia. 5' .05
3/32 dia. 5' .15
⅛ dia. 5' .25

SHEET CELLULOID 12x16 sheet .18

COLORED DOPE All Colors

4 oz. .20
1 pt. .65

CEMENT & DOPES

4 oz. .18
1 pt. .60
1 qt. 1.00

Gas Model dope and paper adhesive same price as cement.

How to Order

Add 15c to orders under $1.50. Orders over $1.50 add 10% of order. For 36" lengths add 10c extra. Add 20c to all orders that contain balsa or wire in 5-foot lengths to cover special handling. All 5 ft. Canadian orders shipped express collect.

secretary of the fathers' Club is taking this opportunity of thanking you for any information that you may give us, and we hope that our suggestions are taken in the light that they are given."

SIDNEY CLUB EVOLVES UNIQUE FINANCE PLAN

The Exchange Club of Sidney (N. Y.), a comparatively new club without a sizable treasury, by the help of Charles J. Keil, National Exchange Club extension representative, has evolved the following plan, with which Harry C. Copeland, of Syracuse, is cooperating:

1—Prizes—Mr. Thomas Z. Fagan, vice-president of the Scintilla Corporation, a subsidiary of the Bendix Corporation, has offered as prizes two valuable gas motors for model planes.

2—Display of Prizes—From January until the time the meet is held in May, the various merchants of the community each will pay $5.00 for the privilege of displaying the prizes for one week. All funds thus paid will be placed in a separate aviation fund by the Exchange Club. Besides the attention-getting value of the display, the $5.00 paid at the time of the exhibit will entitle the merchant to select one model airplane builder as a representative of his firm.

3—Actual Building of Planes—President George E. Steiner expects to appoint a model aviation committee which will arouse interest in and supervise the technical side of model plane building.

4—Actual Model Meet—After a campaign of publicity, a model meet some Sunday in May will climax the activity. The five judges will include: one aviation luminary, two officers of the Scintilla Corporation, and two merchants. Winning contestants will receive the gas motors exhibited.

5—Sending Winners to Detroit—With the proceeds of the exhibit fees, two winners will be sent to compete in the National Model Meet at Detroit July 6 to 9.

GAS MODEL BUILDERS

Do you want a ruling which specifies 10 oz. per sq. foot of wing area, or 8 oz. per sq. ft.? Send your vote on this question to Mr. Chas. H. Grant, editor, MODEL AIRPLANE NEWS, 551 Fifth Avenue, N.Y. City.

Denny Contest Extended

We have received word from Mr. Reginald Denny that his $1500.00 cash prize contest has been extended an extra 30 days in order that every model builder in the country will have a fair chance to win one of the worthwhile awards. Prizes will be paid by June 30th, 1938.

Model builders are anxiously awaiting the new developments that will result from this contest. This pioneering adventure in designing model aircraft will undoubtedly bring forth new ideas which will expand the activity of the whole model aircraft industry as well as that of model flyers.

Dealer Help

We believe that we have a plan that will help you increase your sales.

It's a simple plan too—all you have to do is send us your name and address, on your own letterhead if possible. Many manufacturers have told us that they would like to augment their display advertising with personal letters, circular matter, display cards, tips on new items and other dealer helps. We believe that you will profit by our making your name available to them. Therefore if you are a model airplane dealer it will be to your advantage to send in your name without delay.

The 1938 Dealer List will be compiled beginning March 1st and ending May 1st. Address: MODEL AIRPLANE NEWS, Census, 551 5th Ave., New York City.

BIG MONEY Assembling NEW PORTABLE BOAT!

Carry It On Bike or By Hand.

BOYS—see how easily this 5½ year old youngster carries his MEAD KI-YAK! What fun you'd have with one—AND—you can assemble it YOURSELF at home *in a few hours* from our numbered, cut-to-fit Construction Kit—and SAVE HALF the factory-built cost. Tell DAD about this educational money-making project! Sold direct from factory at low factory prices SO *Rush* 10c NOW for Circulars showing 37 beautiful photos of Mead Ki-Yaks—sailing, paddling, and with motor—Low Introductory FACTORY-TO-YOU Prices. $6 Gift Paddle Offer. HURRY! **MEAD GLIDERS, 15 S. Market, Dept. K-58, CHICAGO.**

$6 PADDLE GIVEN with your CK-KI-Yak—*if you hurry!*

PONTOONS

PLASTIX MADE IN U.S.A.

FEATHER WEIGHT MOULDED PONTOONS, BEAUTIFULLY FINISHED AND DESIGNED FOR PERFORMANCE

These floats will add a realistic appearance and performance that will thrill the most exacting model builders.

10" 1/6 oz.	$ .65 ea.	$1.10 pr.
12" 3/10 "	.75 "	1.35 "
14" 4/10 "	.95 "	1.65 "
16" 6/10 "	1.25 "	1.95 "

All Orders Postpaid

Send for Float Bulletin

MODEL PLASTIC MFG. CO.
19211 Havana Ave. Detroit, Michigan

GAS MOTORS-MODEL KITS

Gas Models ● Flying ● Solid ● Boat Models

THE BEST AND MOST POPULAR GAS MOTORS

New 1938 Ohlsson	$18.50	1938 Chunn "Chum"	$17.50
Brown Jr. "B"	21.50	Brown Jr. "C"	17.00
1938 Dennymite	16.50	Morton Challenger	14.00
Gwin Aero. Upr.	17.50	Gwin Aero. Inv.	18.25
Mighty Midget, Upr.	14.00	Mighty Midget, Inv.	17.25
New Syncro Ace	15.00	Trojan Junior	18.50

FREE Prop and bottle of SAE Oil with each motor

The Best and Most Popular Gas Model Kits

Miss Philadelphia	$ 9.95	Miss America	$ 9.50
Denny Junior	9.50	Super Buccaneer	8.50
Scorpion Major	10.50	Scorpion Senior	10.50
Ohlsson Pacemaker	10.00	Custom Cavalier	15.00
Red Zyphyr	6.95	Comet's Clipper	6.50

FREE with each Kit. Pint of any color Dope

15% Off Total On Any Gas Motor And Any Gas Model Kit If Purchased Together—Other Free Gifts Included

ALL ORDERS SENT POSTPAID

We Handle a Complete Line of the Following:

Gas Motor Accessories & Everything For All Gas Motors.
All The Popular Flying Model Kits & Supplies.
All The Popular Boat Model Kits, Motors & Supplies.
Solid Model Kits, Supplies & Model Building Material.
Completely Finished ⅛" Scale Solid Models.

JOIN THE MODEL BUILDERS CLUB!

GAS, FLYING, SOLID, BOAT MODEL BUILDERS, AMATEUR DESIGNERS, ARTISTS, ETC.

Write for information on the organization and how to join the club.

MODEL BUILDERS
3175 Warrington Rd. Shaker Heights, Ohio

"Gas Lines"

(Continued from page 36)

tion announces their first annual gas model classic to be held in Philadelphia on Sunday, May 29th. Prizes will be worthwhile and plentiful. The Sunday date was finally agreed upon to allow many contestants to attend who otherwise would have been unable to do so. Timer flying will probably be the order of the day, so have timers attached in working condition. For further information contact Mr. Jesse Bieberman, 3219 East Brighton Street, Philadelphia, Pa. Further announcements will also appear in this magazine.

California

Mr. Clyde R. White of 1015 Flower Street, Bakersfield, Calif., tells us that the former I.G.M.A.A. unit in this city held a very successful contest under the 1/16 ounce gas allowance rule. Mr. White remarks that he feels the regulation of fuel allowance is very bad as it penalizes heavy wing loadings. If such is the case it is performing a noble function, inasmuch as extremely heavy wing loadings produce high speeds in gas models, and high speeds create a greater danger to objects that they may hit as well as considerable damage to themselves. We believe high wing loadings should not be encouraged in general practice but rather confine this condition to experimental work. Mr. White's report of the contest and its winners follows:

"WINNERS: Adult Division—Eugene Myers—Scout—Cyclone powered 3:30 Louis Emery—Miss America—Forster powered 3 min. 20 sec.

Junior Division—John Stockton—6' KG—Gwin—2 min. 49 sec. Bud Chapman—Original—Gwin—59 sec.

PRIZES awarded by Harry Coffee, Denny Model Supply Co., Modelcraft, Stewart's Model Shop, Myer's Model Shop, and the 20-30 Club.

TIMER: E. P. Van Leuven.

"The contest was very successful inasmuch as it was our first. Half of the entrants were adults.

"Incidentally we use celluloid gas tanks devised by Mr. Herman Latta, who is now attending Curtiss-Wright School. Mr. Latta was not able to come up for the meet, but he is one of our best builders.

"My own ship is a four foot model with a 1 lb. per sq. ft. wing loading, being powered by a Cleveland Tom Thumb. I had trouble with the gas tank (a celluloid one) as it had a leak (I hadn't tested it before the meet) and cement would not stick to the oily surface. However, a celluloid tank works very well. My ship worked very well on the first flight and is the third I have built."

Mr. R. Mayes of 594 35th Street, Oakland, California, secretary of the Northern California Gas Model Association, sends us a report of a contest they recently held. The meet was directed by Mr. Waldmar E. Doyle of Sacramento, who is also director of the Model Contest of the California State Fair. There were 97 contestants entered. Mr. Mayes makes an interesting comment in his letter, as follows:

"The planes were all weighed and measured to come up to the minimum wing loading of eight ounces per square foot of wing area. It is interesting to note that only two models were under this loading, the average being about ten ounces per square foot. The contest was of the maximum engine run type, the engine run not to exceed thirty seconds nor less than twenty seconds.

"Each plane was allowed three official flights, the total time of the three flights to count as the score. This type of contest is the absolute favorite, at least in Northern California. We believe that by taking all three flights into consideration it helps immensely to do away with that one luck flight that usually wins contests.

"Richard Schumacher of Oakland won with a total of 725.2 seconds for his three flights. I believe 'Schooey' well deserves this victory as he has the finest plane in this state and nobody has been able to beat him. R. Snow of Fresno took second place with 437.2 seconds. Snow always turns in very consistent flights."

Former I.G.M.A.A. Units

Wisconsin

We hear from Harry G. Hansen, Boys' Work secretary, Y.M.C.A., Waukesha, Wisconsin, who is also director of Unit 78. He recently sent us a copy of the by-laws of this unit, which may be helpful as an example for other units who wish to establish by-laws. They are:

Article One

This organization shall be known as the Waukesha Model Airplane Club.

Article Two

Purpose

Section One—To promote model airplane building and flying in the city of Waukesha.

Section Two—To provide for contests for members.

Section Three—To provide for exchange of worthwhile ideas.

Article Three

Membership

Section One—Any person over twelve years of age may be admitted into membership by a two-thirds majority.

Section Two—Members may be expelled by the two-thirds majority vote, after they have been given a hearing by the executive committee.

QUALITY ● PERFORMANCE ● VALUE

THE THUNDER BIRD

Now! With Colored Berryloid Dope.

New Cyclone offers the greatest kit value of the century—The "Thunder Bird," complete with two ½ pt. cans of Berryloid Colored Dope, streamlined air wheels, finished hardwood prop, cut out ribs and formers, shaped trailing edge, masking tape, more than enough wood, cement, dope, wire, hardware, paper, etc., and the largest single sheet gas model plan printed, crammed with details of all types of motor mountings, timing switch detail, etc. Complete Deluxe Kit as above ..... **$6.75** p.p. in U.S.A.

Minus Liquids and Air Wheels but with colored Bamboo Paper.....$3.95 p.p in U.S.A.

Complete plans for the "Thunder Bird" 50c p.p.

Combination Offer: Latest type Mighty Midget

motor (ready-to-run) and Deluxe kit, only **$16.95** p.p. in U.S.A. ($20.75 Value.)

Catalog and Combination Prices With Other Motors on Request.

SPECIAL—Gas Model Props 50c.

Made in U.S.A. Standard design recommended by motor manufacturers. Made of clear hardwood with high gloss finish. Sizes 9"-12," 50c p.p. 13"-13½"-14", 59c p.p.

DEALERS WRITE
NEW CYCLONE AIRCRAFT CO.
397-11th St., Brooklyn, N.Y.

Article Four

Officers

Section One—The officers of the club shall consist of a President, Vice-president and a Secretary and Treasurer.

Section Two—Election of officers once a year.

Section Three—A majority vote shall elect officers.

Section Four—A two-thirds majority vote shall remove officers.

Article Five

Duties of Officers

Section One: President

(a) Preside at all meetings.
(b) Shall cast vote only in case of a tie.
(c) Shall appoint committees.

Section Two—Vice-President

(a) The vice-president shall preside in the absence of the president.
(b) He shall assist the president.

Section Three—Secretary and Treasurer

(a) He shall keep the minutes of all the meetings.
(b) He shall keep the club record.
(c) He shall make an account of all the money.

Article Six

Meetings

Section One—Meetings shall be held at the Y.M.C.A. every Wednesday night at 8:00 P.M.

Section Two—Members must be present at least once a month or have a satisfactory excuse.

Article Seven

Dues

Section One—Dues shall be ten cents per month.

Section Two—If a member's dues are more than three months behind he is automatically dropped until he pays his dues.

Article Eight

Executive Committee

Section One—The executive committee shall consist of the president, vice president and the secretary and treasurer.

Section Two—Powers

(a) They may excuse absent members.
(b) They shall draw up contest rules, subject to approval of majority of the members.
(c) They shall supervise the weekly programs.

Article Nine

Order of Business

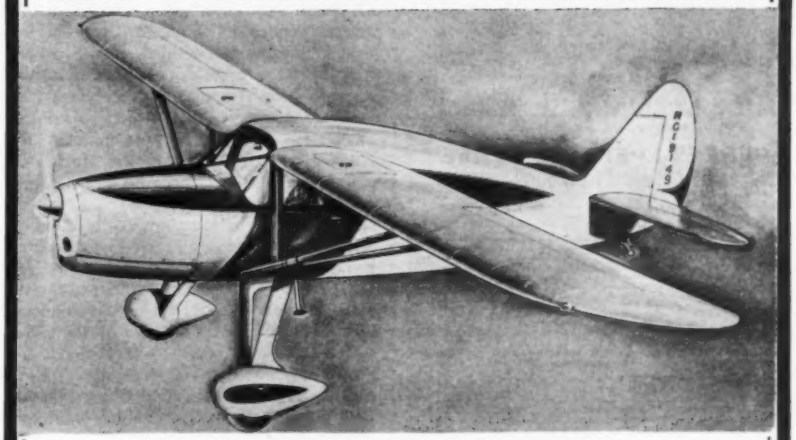
1. Roll Call.
2. Reading of Minutes.
3. Sec.-Treas. Report.
4. Report of Committees.
5. Elections.
6. Old Business.
7. New Business.
8. Speakers or Program.
9. Adjournment.
10. Meeting of the Executive Committee.

Article Ten

Amendments

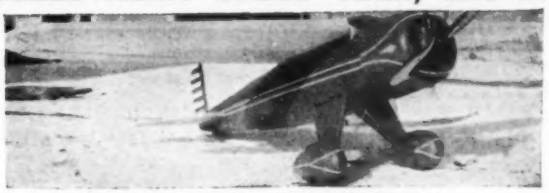
These by-laws may be amended at any meeting by a two-thirds majority provided a copy of amendments has been sent with the announcement of the meeting.

NEW FAIRCHILD 24 GAS MODEL



Span 69". Weight with motor 3¾ lbs. Color, cream and blue
Const. set has ready cut ribs and wheel pants, printed fuselage formers, set of colored dopes, glue, etc., 3¼" M & M Air Wheels, silk covering, full scale drawing, and all parts. Const. set, complete, postpaid..... **$10.95**

LOCKHEED ARMY SPEED VEGA, GAS MODEL



Span 82". Length 54". Weight with motor, 5 lbs.
Const. set has ready cut and notched formers, ribs, wheel pants, turned balsa motor front, 4½" balsa wheels, silk covering, switch, and all parts. This is a dry set without liquids. Price..... **$17.50**
Price is F.O.B. New Brighton. Sent express charges collect.

Skeleton view of 82" Vega above, showing detail
SEND 10c COIN for 16-page Illustrated Catalog showing rubber driven models, motors, gas models, etc.
MINIATURE AIRCRAFT CORP., 83 Low Terrace, New Brighton, N. Y.

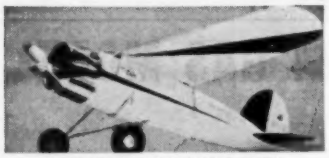
Nebraska

On October 24th the Middle-West Gas Powered Model Aeroplane Contest and Meet was held at Benson Park, in Benson, a suburb of Omaha, Nebraska. This was sponsored by the Benson Commercial Club, in conjunction with the 50th year anniversary celebration of Benson. James B. Dugher is president of the Commercial club. The contest was put on in a very elaborate way by the committee, whose chairman is Waldo Schaeffer. An elaborate program was issued, covering every feature of the meet and included rules, regulations, program of events, prizes, etc. Twenty-seven prizes were given for various events. The units of the I.G.M.A.A. that participated were:

Unit No. 19—sponsored by Omaha Model Aeroplane Co., Mrs. Earl Lane, Prop., 3120 Taylor Street. Unit No. 75—sponsored by the Heim Radio and Aeroplane Shop, Mrs. Jerry Heim, Prop., 5968 No. 30th Street. Mr. John Eggelston, president of the unit. Unit No. 81—sponsored by Mid-West Aeroplane Co., Mr. W. H. Durand, Prop., 4971 Miami Street. Mr. Tod Gemmer, president. Unit No. 109—I.G.M.A. Fort Des Moines Aero Club, Des Moines, Iowa. Robert F. Watson, president.

Michigan

We hear from Roy Kuennen of 123 Straight Avenue, Grand Rapids, Michigan, who is secretary-treasurer of the Kent Flying Club, I.G.M.A.A. Unit No. 113. He tells us of a contest which was recently



"LOCKHEED VEGA WINNIE MAE"

Wing Span 3 Ft. Length 25 In. Weight 11 Oz. Flies with Trojan or Brat or any 1/8 or 1/10 H.P. motor. Complete Kit with Air wheels and Silk.....$5.00

Mfg. by us and comes packed in a wood box.

"FREE" "FREE" "FREE"

Just think with each assembled motor you receive an extra GUARANTEED SPARK PLUG and a HARD WOOD PROP. With each MOTOR KIT or GAS POWERED AIRPLANE KIT you receive a perfect HARD WOOD PROP.

We also stock the following kits for immediate delivery

C-D Stinson Reliant	$ 8.50
C-D Rearwin Speedster	$ 4.85
AIRCRAFT Taylor Cub	$ 4.95
MEGOWS Quaker Flash	$ 4.95
COMET Curtiss Robin	$ 5.95
ROBIN with Air Wheels	$ 7.50
THE DENNY JR.	$ 9.50
OHLSSON'S PACEMAKER	$10.00
COMET CLIPPER with timer	$ 4.95
COMET CLIPPER Timer and AIR WHEELS	$ 6.50
MODELCRAFT'S PACIFIC ACE Complete	$ 8.50

WE STOCK THE FOLLOWING MOTORS FOR IMMEDIATE DELIVERY

1938 Mighty Midget Motor	$14.00
1938 Mighty Midget Inverted	$17.25
1938 Syncro Ace	$15.00
1938 Gwin Aero—with Exhaust Pipe	$17.50
1938 Gwin Aero Inverted	$18.25
1938 B-Model Brown Jr.	$21.50
1938 C-Model Brown Jr.	$17.00
1938 Improved Ohlsson	$18.50
1938 Trojan Jr. 1/8 h.p.	$18.50
1938 Brat 1/10 h.p.	$16.50
1938 BUNCH WARRIOR	$12.00
1938 CHUNN Bore 5/8 Weight 3 1/2 oz.	$17.50
1938 HUSKY JR. Bore 5/8 Weight 4 ozs.	$12.50
1938 DENNYMITE	$16.50

Motor Kits

1938 Mighty Midget Motor Kit	$ 9.85
1938 Gwin Aero Kit	$11.35

For Inverted Motor Kits Add 25c

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held at Grand Rapids. He says:

"The meet was held under I.G.M.A.A. rules and regulations. The contest started at one o'clock and the appearance event was held first. The first place was taken by a married man, Paul Bogardus, Roy Kuennen second, Walter Good third, Ray Slominski fourth. At two o'clock the duration event started. Roy Kuennen captured first place with a out of sight flight of 57½ minutes. Walter Good second with 6½ minutes. Roy Kuennen's plane drew 6/16 oz. fuel. The plane took off slowly heading into a 23 mph wind with the motor sputtering. It soon started, going to town by really climbing. After a two minutes and ten secs. motor run it was at an altitude of two thousand feet. It was here that the motor stopped and the plane started to soar. After 38 minutes I lost sight of it in the haze of the clouds which were at a height of 5,000 feet. The model was in sight of the judges all the time, since they were looking through field glasses. It then started to come down, gliding very flatly, when the stop watches recorded 57½ mins. The timers lost sight of it behind a row of trees. An airplane was chartered at the city airport and it was located near where we thought it had landed. It had landed thirteen miles from where I launched it. The judges were Floyd Wood, Curly Tathem, Ed Penney, Jule Gietzen, and Mr. Thomas Walsh, Airport manager."

QUESTION AND ANSWER DEPARTMENT

It appears that a new department of "Gas Lines" is becoming a necessity. A great many questions are coming in concerning designing, building and flying gas model planes. Therefore a question and answer department will be included.

Howard J. Rosan of 1955 Sedgwick Avenue, New York, New York, has a number of questions concerning the design of a wireless-controlled gas model, about which he asks in a recent letter. He says:

"The motor will operate a generator to provide the energy necessary to move the controls."

Question: Do you think it practical to have a motor-driven generator?

Answer: No, for the simple reason that the speed of the motor might vary and fluctuation in the current would result. Batteries should be used.

Question: If such a generator could be used, would 1/5 hp. be enough or do you recommend more?

Answer: One-fifth horsepower would not be enough power in a radio-controlled plane. The weight of the radio at present makes it necessary to build a fairly heavy ship which would weigh, with radio, approximately ten or twelve pounds. One-third or one-fourth horsepower engines would fly such a ship.

Question: How much weight can such a plane lift?

Answer: It is advisable that the plane weigh not over twelve pounds. If the plane weighs seven pounds, including motor, there would be a balance of five pounds for the radio.

Question: What airfoil would you recommend?

Answer: Any high lift airfoil would be suitable. The Grant No. 3, used on the KG, has proven itself to be an airfoil suitable for this purpose inasmuch as it gives a high lift and slow speed. The Eiffel No. 431 would also be suitable.

Question: Would air wheels and shock absorbers make the landing "soft" enough?

Answer: Yes, provided these things are used in a suitable manner.

Question: Do the formulae for finding the area of the tail surface given in Mr. Grant's recent series, "How to Design Your Fuselage Model," apply to gas models also?

Answer: Yes, however on gas models the fin should be approximately 7% of the wing area and the stabilizer may be as small as 25%. This reduction in size of gas model tail surfaces over those required on rubber models is due to the centralization of weights in a gas model.

NOTICE

John Tsagaris of 855 Grove Street, Irvington, New Jersey, writes:

"I am a member of the former I.G.M.A.A. At one of Mr. Shereshaw's contests, sponsored by former Unit No. 2, my engine was stolen. The serial number is: Brown Junior engine, No. B-2137. I would appreciate any information concerning its whereabouts, if found."

Air Ways

(Continued from page 35)

South Carolina, P.O. Box 579, sends us picture No. 9 of his brother holding a "Flea" model which he has constructed As many readers know, the Flea is a rubber-powered model built in imitation of a gas model. To date the best flying the model has made is one minute, fifteen seconds.

A great deal has been said about speed models, but there always seems to be a great mystery enshrouding this type of ship, for model builders seldom see these ships when they perform. This is probably due to the fact that they are not built universally but rather intensively in certain localities. Picture No. 10 provides proof of the great interest in this type of ship. Speed races are held each year at Salt Lake City, Utah, and the picture shows a line-up of speed planes that competed in the 1937 races. Probably this is the largest number of speed models that our readers have seen assembled at any particular time. All the models shown and entered in the race are scale or semi-scale ships. The competition was won by the ship which appears eighth in the rear row, with a speed of 60 miles per hour. The plane was clocked over a 44 foot course.

There are objections to such a short flight distance. First of all, any error in the time of planes is magnified. Second, to make speed over such a course is more a question of how much rubber rather than upon a careful design of the airplane. Your editor wishes to advocate a change in the length of the speed courses to 264 feet, which is just 1/20 of a mile. When a plane is to make speed over such a course the volume of rubber used is not the only factor to consider. The ship then must be directionally stable and controllable. It is certainly easier to build a

ship to fly over a 44 foot course, but it is more worthy of the ability of an expert builder to fly the longer courses of 264. This will induce greater thought in the design of speed ships and greater knowledge of their operation.

CLUB NEWS

Massachusetts

The boys in Boston, members of the Boston-Traveler Junior Aviation League, Jordan Marsh Company, Boston, Massachusetts, are still breaking records. They started to do this way back in the dim past. Ralph Brown of Arlington, Mass., who is sixteen years of age and a member of the club, broke the flying scale record by making a flight of 41.5 seconds with his accurately scaled Fairchild. A short time before John Golden had made a flight of 41.3 seconds, and had left the contest. He therefore did not witness the flight of Brown's which surpassed his. However, both flights are to stand as records, for John Golden is a senior and Ralph Brown is a junior.

Picture No. 11 shows Brown and one of his gliders. At the same contest Brown, flying for the last time as a junior contestant, is believed to have set a new helicopter national record with a flight of 2 minutes, 15.5 seconds.

Illinois

We hear from Frank J. Parykaza, publicity director of the Illinois Model Aero Club of 430 South Michigan Avenue, Chicago, Illinois. He tells us that the club members are not only busy flying models but hold regular meetings at which problems in model design and general aerodynamics are discussed.

He sends us picture No. 12 which shows a group during an informal discussion on gas models. Mr. Walter Broch, a director of the club, is explaining the sketch.

In their club paper, "The I.M.A.C. News," we note there is an argument among the members as to who originally made use of the idea of the large stabilizer. Unquestionably a number of model builders used this idea quite a few years ago. However, we know definitely that Carl Goldberg started to use large stabilizers as early as 1931. The idea was passed on to him by your editor, Mr. Grant, who advocated the use of large stabilizers as early as 1920. During the years following 1920, Mr. Grant followed this practice continually and many unusual flights were attributed to this one feature in planes built by him. The large stabilizer idea was not generally accepted by model builders before 1932. Many of the older builders will remember the very small tail planes with inverted camber that were used on indoor ships from 1927 to 1930. In fact, many model builders at this time derided the idea of large stabilizers. However later they accepted it as being a necessity for stable flight. We will be pleased to hear from readers who have any more information concerning the date at which large stabilizers were used by them.

California

We have an announcement from Mr. Dale Willoughby of 2408 Valleyview Avenue, Whittier, Calif., that the Whittier Eagles club has just been organized. He says:

"The officers are: Jay A. Warner, president; Dale Willoughby, vice-president; Don Starkey, secretary; and Heston Crain, publicity manager. The requirement for membership is to build a plane and present it to the council for acceptance. If accepted (we are quite liberal) an initiation fee of $.25 is charged. The club meets every Tuesday night at 7 o'clock and any one interested please drop around any Tuesday."

MODEL NEWS FROM OTHER COUNTRIES

England

Mr. G. E. Pearce of 1 Florida Road, Ellacombe, Torquay, Devon, England, sends us picture No. 13, which shows three of his flying scale ships; one a Hawker Hurricane, another a French Potez and the plane in the background, a Hawker Nimrod solid scale model. Mr. Pearce says he is a member of the Torquay and District Model Aeroplane club which has just been formed.

We have important news of the Wakefield Contest from our old friend, Harry York, of 2 Scutari Road, Dulwich, London. Mr. York tells us that he recently attended the F.A.I. Conference in Paris, at which arrangements were made for the 1938 Wakefield meet. This contest will be held at the Cauldron-Renault Aerodrome, near Versailles, France, on Sunday, July 31st. Mr. York further says:

"The C.F.M.R.A. have undertaken to get the American models through the French Customs on condition they are all packed in one crate and, for the purpose of customs duty, labelled 'models for competition,' with the correct forms filled

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12" Curtiss Pursuit	12" Polish Fighter
12" Douglas Observ.	12" Puss Moth
12" Curtiss Falcon	12" S.E.5
12" Fokker Triplane	12" Vultee VI.A
12" Fokker D8	12" Vought Corsair
12" Hell Diver	12" Waco Biplane
12" Hornet Moth	12" Fleet Trainer
12" Gulf Hawk	
15" Fokker D7	15" Kinner Sportster
15" Lockheed Vega	15" Nieuport
15" Northrop	15" Stinson Reliant
15" Taylor Cub	15" Ryan ST
15" Rearwin Speed.	15" Cessna C34
15" Miles Magister	15" Timy "S"
15" Fairchild "45"	15" B.A. Eagle
15" Messerschmitt	
16" Cessna	16" Curtiss Falcon
16" Bellanca	16" Boeing F4B4
16" Aeronca	16" Fairchild
16" Monocoupe	16" Brown Sportster
16" Taylor Cub	16" Aeronca
16" Endurance	16" English Puss Moth
16" Chester Racer	16" Fokker D8
16" Curtiss Coupe	16" Polish Fighter
16" Vultee	16" Spad
16" Curtiss Hawk P6-E	16" Spartan Biplane
16" Tiger Moth	16" C. Wright Coupe
16" Farman Stratoplane	16" Ryan Cabin
16" Heath Lindberg	16" Mr. Mulligan
16" Consolidated BT7	16" Vought Pursuit
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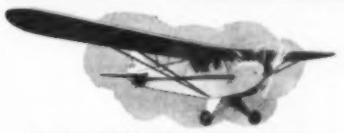

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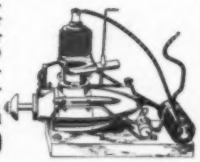

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50c MODELS—Aeronca C-3, Hawker Monoplane, Fokker DVII, Taylor Cub, Junior Endurance, Monocoupe, Percival "Vega Gull."

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in and the senders' guarantee to pay return carriage. The models must be addressed to the C.F.M.R.A. 134, Boulevard Haussman, Paris, France. The French have undertaken to provide proxy fliers, but they will not, as the S.M.A.E. have done in previous years, alter models to conform with the rules of the competition. On several occasions, the S.M.A.E. have, on checking the models, found discrepancies which have been corrected. The C.F.M.R.A. are, however, willing to have the models repaired should they suffer damage in transit."

FOLLOWING ARE THE WAKEFIELD INTERNATIONAL CUP RULES:

The competition shall be open to all nations, whose teams shall consist of not more than six individual competitors.

Contest to be for fuselage rubber-driven models, the rubber motor of which must be concealed and the fuselage or fuselages must be fully covered and conform to the formula:

$$\frac{(\text{Overall length of model})^2}{100} = \begin{cases} \text{minimum area} \\ \text{of maximum} \\ \text{cross-section} \end{cases}$$

The following conditions must be complied with regarding area and weight of model:

1. Total area of main plane (planes) to be 200 square inches with a plus or minus tolerance of 10 square inches (area being projected area of cambered surface viewed from above while in position). The area of the tail plane must not exceed 33% of that of the main plane (s).

2. No model shall have a total weight of less than eight ounces.

3. Models, including airscrew, wheels and, if used, gear-boxes (not gears), must be constructed by the entrant.

4. No part of the model shall become detached during its flight. The competition shall be for duration of flight, such duration being taken from the time model is released until it first touches some solid object after flight, or until passing out of sight of the Judges.

Each model must rise from the ground from a standstill entirely under its own power, transmitted by air screw (air screws); no push whatever permitted.

Each entrant shall be allowed three attempts during the competition; the average duration of the three attempts to be counted.

When called by the Judges each model must be ready for flight within three minutes or the entrant will be liable for disqualification in that round.

Minor adjustments may be made between competition flights but trial flights will only be made with the consent of the Judges, after which the model must be re-weighed.

The Judges' decision shall be final.

The winning nation shall be that which attains the highest average duration of three flights made by any one individual competitor of its team.

WINNING NATION TO HOLD THE CUP FOR ONE YEAR.

Mr. H. Aldworth of 55 Saint Thomas Road, Crookes, Sheffield 10, writes that recently a society for model builders, called the Sheffield Model Aircraft Society, was founded by Mr. Bob Hemingway. Besides model building a series of lectures are being held by the society at the Carver Street Schools, Sheffield, which are very popular and largely attended. The present membership of the club is 28.

Italy

Mr. Ph. Mancini, Via Carducci 16, Milan, Italy, writes and tells us that he was overjoyed to find a copy of MODEL AIRPLANE NEWS on the newsstands in Milan. He noted that very little Italian news was given, so he has undertaken to tell something of Italian model aviation. He says:

"Though the government has adopted an unadvertised policy, they are doing many things and saying little about them."

Mr. Mancini objects to several remarks made about Italian aviation by Mr. Morrison in "Frontiers of Aviation". We feel that possibly Mr. Mancini is correct. He believes that Italian airplanes are nearly as good, if not more so, than most of the planes produced in various other countries. As an aeronautical engineer Mr. Mancini's opinion is valuable. He calls attention to the many record breaking planes which Italy has turned out; especially speed, distance and load records. Many of these records have been recently made and are awaiting certification by the F.A.I.

He also calls attention to the fact that C. G. Gray in the October 1937 issue of "The Airplane", dealing with the Milan International Aeronautical Exposition, gives a great deal of information concerning the performances of Italian planes. We suggest that readers who are interested look this up at the public library.

NOTICES

James Throckmorton of 121 North Congress Avenue, Atlantic City, New Jersey, sends us some news of the Atlantic City Model Plane Club. He says:

"We have a meet every other week in our convention hall ballroom and have been doing much indoor experimenting. The local Exchange Club is soon sponsoring an indoor meet in the main 135 ft. ceiling hall, open to all in the east. Good prizes will be awarded. Events are: Class C endurance, Endurance Cabin Fuselage and Endurance event for indoor pusher only. Write the club secretary care of Central Y. M. C. A. for details, etc.

From Bernard Schwartz, contest director of the Chicago Park District, Chicago, Illinois, we have received the following report of a contest held there:

"Saturday, February 19—at the 124th Field Artillery Armory, the Chicago Park District held a City Class A Glider Contest, the first of a series of four such indoor meets.

"Phenomenal times were made by The Aeronuts, The Leaders Club and the boys from Section 6 of the Chicago Park District.

"The highest average of three best flights determined the winners. The best flight was made by Milt. Hugulet. His time was 51.2 seconds; this flight was closely approached by the 51 second time made by Wallace Simmers.

"The winners were as follows:

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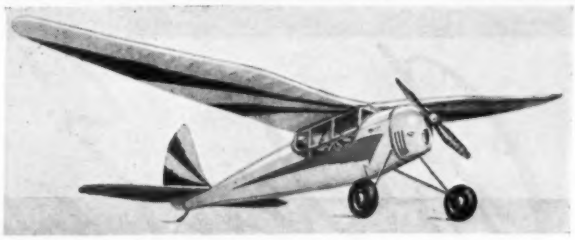

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Juniors

1st	Louis Tucker	Riis Leader's Club	40.7 second average
2nd	Ed Sjoboda	Brands Park	32.2 second average
3rd	Art Mueller	Hamlin Park	30.9 second average
4th	Henry Klein	Chase Park	27.6 second average

Seniors

1st	Milton Hugulet	The Aeronuts	49.6 second average
2nd	Wallace Simmers	The Aeronuts	49.0 second average
3rd	Ed. Muir	The Aeronuts	46.1 second average
4th	Richard Grenshaw	The Aeronuts	45.5 second average

"The three meets to follow are R.O.G. Duration Event February 26; Indoor Stick, March 5; Fuselage Model, March 12.

"On March 19th at Blackhawk Park, the Chicago Park District Leader's Club held an indoor hydro contest, with the swimming pool the center of activities. Results have not yet come in."

Mr. L. Wiederhoeft of Wausau, Wisconsin, Route 5, has asked us to announce that an outdoor contest, sanctioned by the NAA, will be held on May 1st, weather permitting. It is for classes C and D fuselage and C and D stick models, NAA weight rules throughout. Anyone wishing to compete must show their NAA membership card. The contest is to be held at the Alexander Airport, Wausau, Wisconsin. Further information may be obtained from Mr. Wiederhoeft at the above address.

Mr. Stuart Hardendorf of 17010 Elsienna Avenue, Cleveland, Ohio, writes and says that his father, a World War pilot, told him something about the Christmas Bullet. Possibly some of our readers may remember this unusual ship. It was designed by Dr. Christmas of Buffalo, New York, was one of the first cantilever airplanes and had a speed of about 200 miles per hour. It is true that no pilot ever opened up the engine of this plane and lived to tell the story. Many fatalities were incurred in flying this ship; which were all due chiefly to the fact that the wings were built on the principle of flexibility. In fact they were so flexible that they flexed entirely off the ship at high speed. The idea was fine theoretically, but sad practically. In few words, the trouble was that the wings were not built sufficiently strong. This plane was one of the unusual ships of 1916.

Vincent Carmen Petrill of 1822 East Passyunk Avenue, Philadelphia, Pa., sends us a report of a very interesting demonstration recently made by the latest type autogiro.

"An autogiro model has recently been perfected by a pooling of the dual resources of James G. Ray, a former autogiro test pilot, and Carl B. Chupp, a former manager of the Pitcairn Autogiro Company.

"Ray, who is thoroughly acquainted with autogiros, at one time landed one on the White House lawn, and another outside the Capitol. Together with Chupp, they developed a 36-inch autogiro model in the cellar of Chupp's home at 218 Jericho Road, Abington, Pa. They call it the autogiro glider.

"This autogiro model rises by means of a tow-line that the flier operates. Constructed mainly of balsa wood, the whole craft weighs about 8 ounces. It has a two-bladed rotor, mounted on double ball-bearing mounts with flexible joints, so that the model operates on the principle discovered some years ago by the late Juan de la Cierva, its Spanish inventor.

"The blades are aerodynamically fashioned and balanced, being weighted, to bring the center of gravity sufficiently forward, by a strip of heavier pine wood along the leading edge.

Have you read the combination Subscription Offer on page 44?

PROPELLERS

- ANY QUANTITY
- FINEST BALSA
- TRUE PITCH
- 4" to 16" DIAMETER

Manufacturers of model airplane kits as well as model builders, are now assured of an unfailing source of supply for propellers of any size or quantity. Comet's Supply Division is prepared to produce Balsa propellers of absolutely true pitch, cut to the highest precision standards, on short notice. Volume production assures lowest prices. Let us quote you on your needs.

WRITE on Letterhead for FREE SAMPLES and LOW PRICES

COMET TIMER FOR GAS MODELS!

Amazing new timer. Simple, foolproof. Adjustable 10 to 50 seconds. Ready to install—each timer complete with directions in attractive carton. Weight ¼th ounce. Patent pending. Write for further information. Price only..... **50c**

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GOING OVER BIG! These TWO NEW COMET

A *New* TYPE OF GAS MODEL

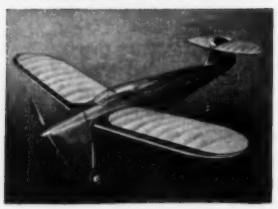
The COMET *Golden Eagle*

WITH NEW COMET AUTOMATIC TIMER [PAT. PDG.] (IN DELUXE KIT)

Fly it as a

HIGH-WING

A MID-WING



A LOW-WING

—*especially designed for* THE SMALL MOTOR!

COMET designers present gas model enthusiasts with a distinctly new type of gas model especially designed for a small motor. Tested hundreds of times in actual flights. Its versatility alone is enough to stamp it as unique—think of being able to fly a gas model in three different ways—as a high-wing, mid-wing, or low-wing—instantly interchangeable at the field in only a few seconds. The list of contents is impressive for its completeness.

Features of the GOLDEN EAGLE DeLuxe Kit

Wingspan 45"; Length 32½"; weight, ready to fly, including motor, 1 lb. Completely finished parts include Shaped and Rounded Leading Edges, Tapered Spars; Ribs die-cut; Shock-absorbing Bent Music Wire Landing Gear with streamlined Fairing; Semi-carved Propeller, Motor Mount ready to install; Adjustable Battery Mount; 1 pair Air Wheels; Removable Cowling for motor inspection; Motor, Cowl and Battery instantly removable in one unit for servicing; Motor may be mounted inverted or upright; Sliding Cabin Hood for access to Battery. All wire and metal Fittings furnished; Many finished and semi-finished Fittings; Full size 3-view Plans with full size Patterns; Bamboo Paper; Generous quantities of Cement, Banana Oil, and Red, Blue and Yellow Dope.

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Standard GOLDEN EAGLE: Features identical with DeLuxe model. Bent Wire Fittings, Banana Oil and Cement included, no Dope, and a few of the simpler parts in unfinished form for those who prefer to do their own work. Special wheels included. Price **$2.75**

Postage 25c, none if ordered from dealer. Above prices are less motors.
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FREE LEAFLET: "How To Adjust and Fly Gas Models," specially written for Comet by CARL GOLDBERG, given with each kit.

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***Designed for* COMET *by* CARL GOLDBERG!**

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First and Foremost

DESIGNED TO FLY!

Extremely high rate of climb!
New propeller-protection feature!

—with the
NEW COMET AUTOMATIC TIMER
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COMET takes a long stride forward in gas model design with the new COMET CLIPPER! Here is a model whose FLYABILITY can be certified in advance because it bears the stamp of the designing genius of CARL GOLDBERG! To this sensational new gas model, CARL GOLDBERG has given the full benefits of his sound, practical flying knowledge. First and foremost, the CLIPPER has been designed to FLY. It is a fitting climax to the success already achieved by Comet's Curtiss-Robin Gas Model. The price represents a new high in value-giving—a new triumph for Comet's straight-line volume production methods!

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Comet Clipper Kit with air wheels.....$6.50

Postage 25c, none if ordered from dealer. Above prices are less motors. Ohlsson motor for above, $18.50. Brown Jr. motor $21.50.

READ ALL THE *FASCINATING* DETAILS!

1. TEST AFTER TEST—hundreds of actual flights were made before CARL GOLDBERG placed his final approval on the COMET CLIPPER! The amazing FLYABILITY of this remarkable gas model is a matter of record!
2. Wingspan, 6 ft.; Length, 53½ in. Weight (ready to fly), 2 lbs., 5 oz. Wing Loading, ½ lb. per sq. ft. WING AND TAIL instantly and easily detachable for transportation to flying field.
3. New Comet automatic timer included free. Weighs less than one oz. Adjustable from 10 to 50 seconds.
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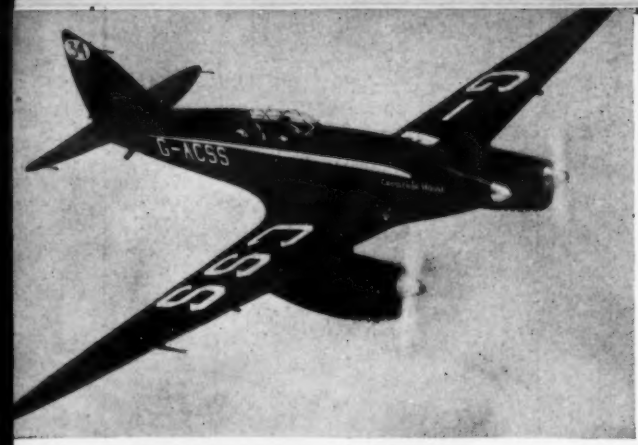

From border to border and coast to coast, model builders are acclaiming

CLEVELAND "AIR-ISTOCRATS"

the standard class of the model world . . . Super-models in looks, authenticity, realism, value. They win prizes and honors galore . . . Yet they cost surprisingly little!

CURTISS (GOSHAWK) F11C-2 FIGHTER

High speed U.S. Navy shipboard fighter. Designed for advanced modelbuilders who want a thoroughly detailed scale model and one which, when completed, represents the acme of perfection in model building. Span 23⅝". Silver, yellow, gray and red. Complete Dry Kit **SF-49**..... **$2.95**
Complete Dry Kit **D-49** (15¾" span), $1.10

EUROPEAN CUSTOMERS!

Modelbuilders in Europe may purchase C-D Kits for exactly the same prices shown here, plus postage only. Payment must be included with order in bank checks, either in U. S. dollars payable in New York or in Swedish Crowns, one crown being equal to $.25 checks payable in Stockholm. No C.O.D.'s accepted. All shipments sent from Freeport. Write H. Ylien, Nybrukaien 7, Stockholm C Sweden.

IN AUSTRALIA K-D MFG. CO. 113B BATHURST ST., SYDNEY

THE LOCKHEED ELECTRA

One of the Great Silver Fleet. The dry kit, as all C-D's, contains absolutely everything necessary to build it like all C-D's except the liquids, which, of course, means all the highest quality of strip wood, all the necessary curved parts printed ready to cut out, wheels, covering tissue, block for pilot, etc., etc., and last, but most important, a full size large C-D drawing and instructions. Has rubber motors protruding through the wings behind the nacelles. Makes an imposing sight in flight, colored all silver. Span 27½". Dry Kit **D-65**, complete except liquids, postfree as are all **C-D** kits..... **$2.75**

DE HAVILLAND "COMET"

These photographs clearly bring out the elegant beauty of this all red powerful, and fast flying De Havilland Comet Dwarf model, which is very beautifully and deftly trimmed in white with silver propellers and spinners. Wheels are fully retractable. Model creates an imposing sight in flight with both men carefully carved and placed in the cockpit. The prototype won the Mac Robertson 11,300 mile England to Australia race in 71 hours. The model has a span of 22" and is an unbelievably beautiful little design, leaving little to be desired and at the ridiculously low price for such a high quality model. If entirely "filled in" and wings and tail surfaces covered over with balsa, it may be kept indefinitely on display as a memento of your flying model days, either for home, office or store. (No SF Comet kits available.)
Dry Kit **D-51**.... **$1.35**

CURTISS HAWK P6-E FIGHTER

Hard to tell this actual 20" "Rep" photo from our ¾" model. Full of typical C-D authentic features and details. Speedy flights.
Dry Kit **R-21**, only..... **65c**
Complete Dry Kit **D-21** (15¾" span), **95c**
Complete Dry Kit **SF-21** (23⅝" span), **$2.50**

See Our Big Ad on the Center Pages

1937 FOLKERT'S SPECIAL

1937 Thompson Trophy winner. Like a flying torpedo. Fast, trim, unique. Has a neat little retracting landing gear, (fuselage flaps cover it) very easily made. Colored all cream with red trimmings, and black and brown details. Span 12". Complete Dry Kit **SF-71**, only... **$1.95**
Complete Dry Kit **D-71** (8" span), only **65c**

C-D's NEW P26-A FIGHTER

This new U.S. Army beauty has a really dazzling appearance—now the most colorful of all C-D's. The photograph of it above just could not do it justice. Model will make high speed flights for good distances. Colored yellow wings, blue fuselage and landing gear with a dazzling tail of white with red scallops, fuselage and wheel shoe trimming is a wide white stripe with a red stripe running through it. Span 21". Complete Dry Kit **SF-60**, only..... **$2.65**
Complete Dry Kit **D-60** (span 14"), only **$1.10**

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Issues 1, 2, 5, 6, 7 of the invaluable CLEVELAND MODELMAKING NEWS are still available at 25c per issue. Or complete set, including issues 3 and 4, for only $1.50. Every issue worth many times its cost. Free in each issue 2 or more big C-D airplane plans.

There's more thrill, more education, more downright satisfaction in building one C-D—than a dozen ordinary models! If you haven't started yet, start today!

SPECIAL GRUMMAN "GULFHAWK"
MAJOR AL. WILLIAMS FAMOUS SHIP

This famous all orange beauty is piloted exclusively by our own famous Maj. Alford J. Williams (to whom we are indebted for assisting us in securing design data). It is beautifuliy detailed and striped in blue with a white outline, the upper wing being painted in a "sunburst" design, being exceptionally attractive. Flies very well, having plenty of wing area. Both stationary and retractable landing gear (for exhibition and first prise contest winning). Complete Dry Kit..... **$5.**

THE DOUGLAS TRANSPORT

A real beauty, this giant size Dwarf. Span of 42⅜". Capable of powerful fast flights with its twin motors. Absolutely complete, the same as all C-D kits are but contains no liquids. Color all silver. Complete

Here's the complete line-up of these world-famous CLEVELAND "AIR-ISTOCRATS"

For those who desire "wet kits" next to the SF model itself, the price of all necessary liquids consisting of 5 to 10 bottles of material, and including striping tape where it is required. All Dwarf Kits are supplied dry as usual for which the two main colors, wood cement and tissue cement may be ordered separately at 10c for each bottle, or 40c for each design except designs Nos. D-35, D-45, D-55, and D-65 for which two ounces each of the four main liquids are required, totaling 72c each. Be sure to add 15c packing charge to each order for liquids. If additional colors are desired, simply add 10c per bottle. Striping tape 36", 5c; 120", 15c.
When ordering, be sure to include 15c additional for packing and postage on liquids, as these constitute parts, whether with or without kits. Shipments will not go forward unless the 15c is included. For example: in ordering Dry Kit SF-1 say: "Please send me the Dry Kit SF-1 at $1.95 and SF-1 Liquids at 63c, plus 15c packing charge—a total of $2.73."
Spans of SF, ¾" scale Kits run from 12" to 55⅝"; D, ½ scale Kits, from 9" to 42⅜". Reps 20" to 28".

LEAD THE WORLD IN QUALITY, REALISM AND VALUE

KIT NO.	NAME	SF ¾" Scale	SF Liquids only	D's ½" Scale	REPS 20" Span
1	Gr. L. Sport Trainer	$1.95	$ .63	$ .65	
2	Travel Air Mystery	2.35	.95	.65	
3	De Havilland-4	2.85	.95	.95	
4	Curtiss "Jenny"	2.65	.90		
5	Laird Super-Solution	1.95	.58	.65	
6	Polish Fighter	2.50	.52		
7	Curtiss Helldiver	2.95	.89		
8	Army Boeing P13-E	2.25	.69	.80	
9	Scouting SE-5	1.25	.42	.55	
10	Sopwith Camel	1.95	.51		
11	A-Wing Quad Fighter	1.95	.58	.65	
12	Bishop's Nieuport	1.95	.58	.65	
13	Spad 13	1.95	.58	.65	
14	Fokker Triplane	1.95	.69	.65	
15	Fokker D-7 Fighter	2.50	.87	.75	.65
16	Albatross D-5A	1.95	.63		
17	Bayles' Gee-Bee	1.95	.53	.65	
18	Howard "Pete"	1.25	.42	.40	
19	Supermarine S6-B	1.95	.57	.80	
20	Hawker Fury Fighter	1.95	.63	.80	
21	Hawk P6-E Fighter	2.50	.99	.95	.65
22	Macon Fighter	1.95	.63		
23	Boeing P-26 Pursuit	1.95	.68	.70	
24	Lockheed Vega	2.50	.95	1.20	
25	Curtiss A-8	2.50	.90		
26	Heath Parasol	1.25	.42	.35	
27	Doolittle's Gee-Bee	1.95	.57	.65	
28	Monocoupe Sport	1.95	.63	.65	
29	Boeing F4B-3 Fighter	2.25	.59	.80	
30	Nieuport 28 Fighter	1.95	.51		
31	Hall Racer	1.95	.58		
32	Boeing 95 Mail	1.95	.72	1.20	
33	Comper Swift Sport	1.25	.42	.45	
34	Fokker D-8 Fighter	1.95	.52	.55	
35	Boeing 247 Transport	5.95	1.45	2.95	
36	Lincoln Sportplane	.95	.42	.25	

KIT NO.	NAME	SF ¾" Scale	SF Liquids only	D's ½" Scale	REPS 20" Span
37	Waco C Cabinplane	2.65	.95	.95	
38	Buhl Bull Pup	1.65	.59		
39	B-J P-16 Fighter	2.75	.87		
40	Aeronca Sport	1.95	.57	.65	
41	Vought Corsair V-65	2.95	.85	1.10	
42	Howard "Ike"	.95	.42	.35	
43	Douglas O-38 Obs.	2.95	.96	1.10	
44	Page's Racer	1.95	.52		
45	Martin Bomber	6.50	1.88	2.95	
46	Laird Solution Racer	1.95	.52	.65	
47	'33 Wedell's W. Wms.	2.35	.87	.65	
48	'34 Turner's W. Wms.	2.35	.87	.65	
49	Curtiss F11C-2	2.95	1.09	1.10	
50	Curtiss Export Hawk	2.95	.95	1.10	
51	D. H. Comet Racer			1.35	
52	"Mr. Mulligan"	2.35	.84	.65	.65
53	Grumman F2F-1 Fighter				.65
54	Hughes Racer				.95
55	Douglas Transport			3.75	
56	Consolidated A-11				.50
57	Old Gr. L. Trainer 2TI-E				.65
58	Ryan ST				.65
59	Hawker Low Wing Fight.				.65
60	Boeing P-26-A	2.65	.83	1.10	
61	Seversky Fighter	2.65	1.07	1.10	
62	Custom Waco C6			1.10	
63	'36 Caudron Racer	1.95	.57	.65	
64	Beechcraft C-17-B			1.10	
65	Lockheed Electra			2.75	
66	Stinson Reliant				.65
67	Fairey Battle				.65
68	'17 Bristol Fighter			.95	
70	William's "Gulfhawk"				.85
71	Kling's Folkert Special	1.95	.53	.65	
	A Pontoon Kit	.35			
	R-X5001 Cleve. Amphibion (28")				.65

COMPLETE GAS KITS (but without power units) with 31½" balsa wheels, shoes, cements and colors.

	KITS WITH PARTS	EXTRA PARTS ALONE
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Enclose 30c Packing and Postage or we'll send by Express. Charges only "collect" when parts are ordered.

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landing gear (for exhibition and first prize contest winning).

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